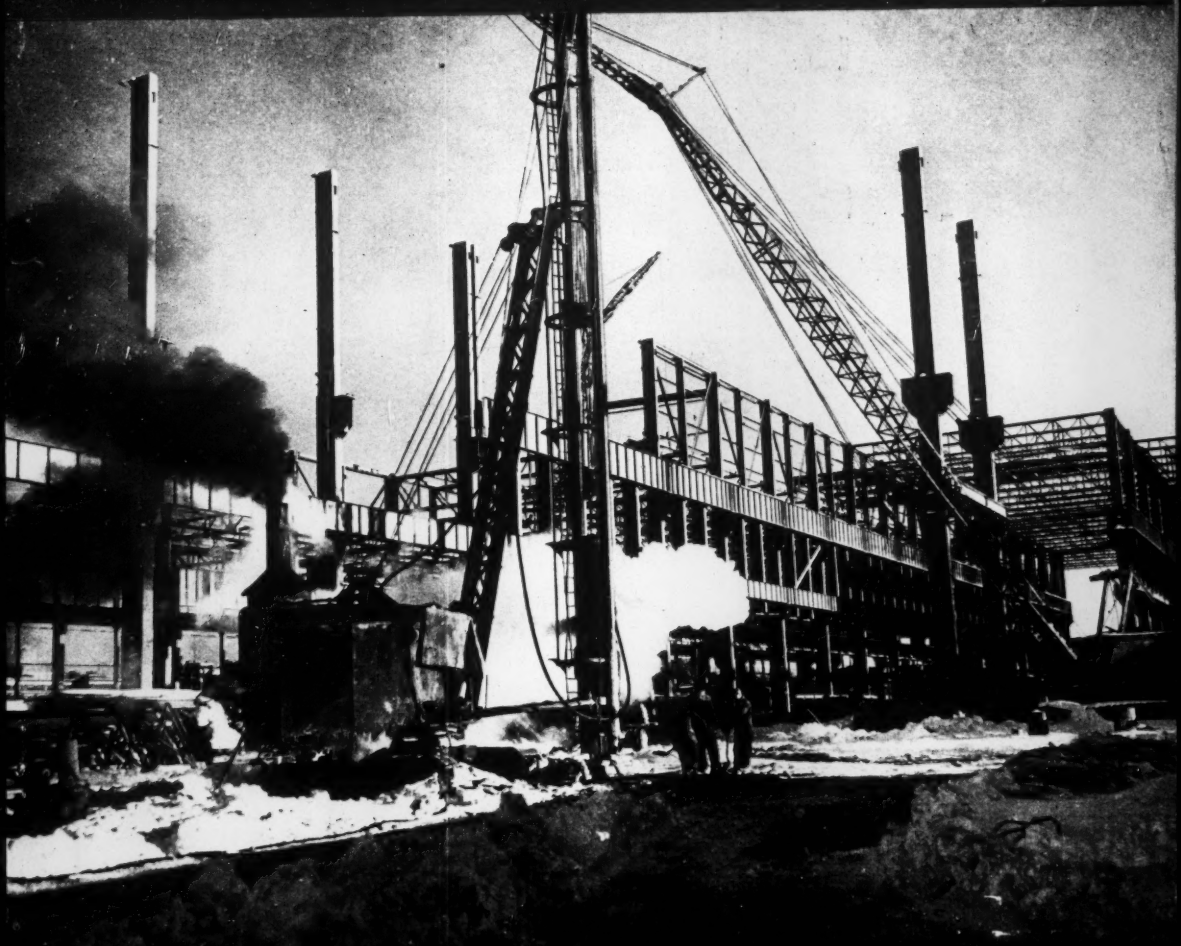
ENGINEERING NEWS-RECORD

APRIL 14, 1949



Limited headroom for new turbine plant required that each segment of crane girder

DISPLACEMENT RAFT SUPPORTS INDIA POWER PLANT

• • •

HUNGRY HORSE DAM WORK GOES ON FULL SCHEDULE

A McGRAW-HILL PUBLICATION

BYERS WROUGHT IRON PIPE

helps to keep this driveway open for traffic *despite* the snow!

The frequent, heavy snows common in the Amsterdam, N.Y. area posed a real problem when the Bigelow-Sanford Carpet Company recently constructed a plant access driveway. This ramp—85-feet long, laid out on a 10% grade, and with a 90° turn—leads from basement to street, and is used by industrial trucks moving materials and finished products between buildings. Any interference with this traffic would delay production and shipping operations, while keeping the drive clear of snow and ice in the usual manner would constitute a major maintenance expense.

The plant engineering staff successfully solved the problem by installing a snow melting system, with a grid of $1\frac{1}{4}$-inch Byers Wrought Iron pipes connected into 2-inch wrought iron pipe headers. With a water temperature of 130°F, the system is designed to melt 2-inches of snow an hour. Residual water and normal storm drainage are carried away from catch basins located at top and bottom of ramp, through 8-inch wrought iron pipe.

The results obtained have fully justified the judgment of the engineers. In a full winter's operation, with snow depths ranging from 18 to 30-inches, the system worked to perfection. The pavement remained clean and dry without the use of snow shovels or chemicals. Fuel costs are estimated to be low.

In an overwhelming proportion of the successful snow melting systems now installed and operating, designers have used wrought iron pipe for four excellent reasons. The pipe is readily formed and welded. It has a high rate of heat emission. It expands and contracts at practically identical rates with concrete, banning stresses and strains. And its resistance to the corrosive conditions encountered has been conclusively demonstrated in thousands of installations where similar conditions existed.

Our booklet, THE A B C'S OF WROUGHT IRON, explains why wrought iron serves longer and better. Ask for a complimentary copy.

A. M. Byers Co., Pittsburgh, Pa. Established 1864. Boston, New York, Philadelphia, Washington, Atlanta, Chicago, St. Louis, Houston, Salt Lake City, Seattle, San Francisco. Export Division: New York, N. Y.

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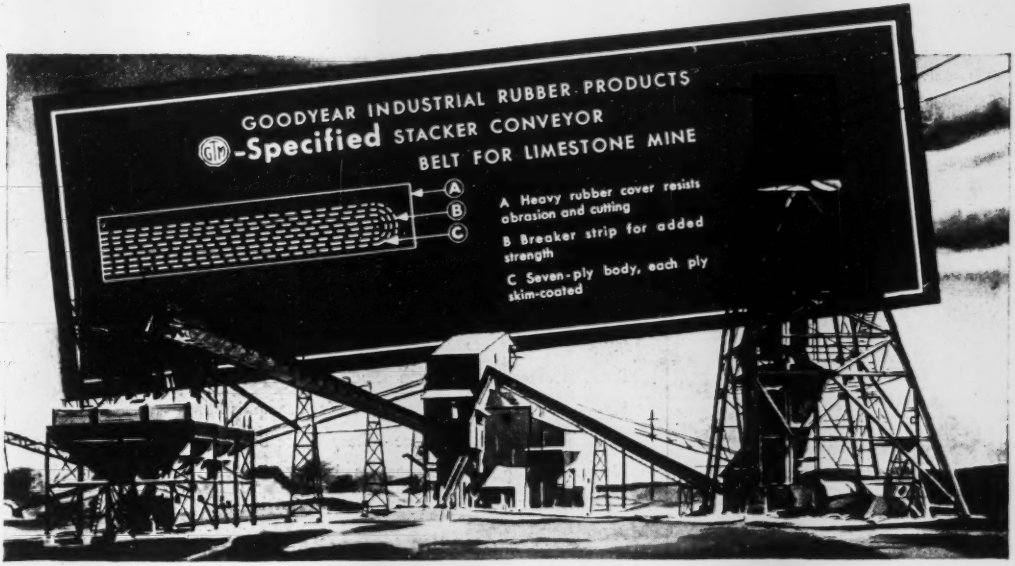
ELECTRIC FURNACE QUALITY ALLOY AND STAINLESS STEEL PRODUCTS



They tote thousands of tons per day

in the world's deepest limestone "mine"

BURIED half a mile under Ohio is the world's deepest "quarry"—a mine that produces limestone at the rate of thousands of tons per working day. And every ounce of that river of rock rides on Goodyear Conveyor Belts for much of the way between the working faces of the mine and storage bins located on the surface.

When the mine owner called in the G.T.M.—Goodyear Technical Man—to recommend the belts best suited to conveyorize the operation, he specified Goodyear Stacker Conveyor to carry the limestone from crusher to storage bins—both located deep in the mine. Three belts—each 42" wide, 7-ply construction—were installed to handle this part of the operation. The G.T.M. recommended Stacker Conveyor because Stacker's extremely tough covers and bonding breaker are more than strong enough to handle the severe abrasion of the rock.

At the shaft head, the crushed rock travels from head frame to storage bins via nearly a half mile of Goodyear 6-ply, 32-oz. duck belting, installed on seven different conveyors handling various sizes of rock.

Altogether, this mine uses a total of ten Goodyear conveyor belts—all installed in accordance with the recommendations of the G.T.M. His recommendations can be your own best insurance of economical, long-life conveyor belt haulage, either above ground or below surface. It will pay you to consult the G.T.M. first. Write him c/o Goodyear, Akron 16, Ohio.

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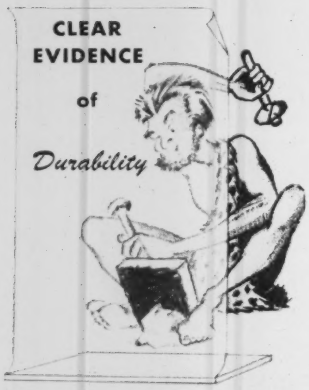

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ENGINEERING NEWS-RECORD

VOLUME 142 **APRIL 14, 1949** **NO. 15**

WALDO G. BOWMAN
Editor

FEATURES IN THIS ISSUE

Hungry Horse Dam Will Plug This Gorge.....Max Ford 58

Girders Act in Unison to Support Cranes..... 62

How to Dispose of Fluorescent Tubes Safely..... 64

Shortcut Publication of Building Ordinances..... 64

Hyperion Digesters Are Mass-Produced..... 65

Panel Heating for Swimming Pools..... 68

Hydraulic Fill to Close River Reach for Memphis Port..... 70

Stainless Steel Panels Inclose 4-Story Office Building..... 73

Natural Hot Spring to Defrost Road Underpass.....O. R. Kennen 74

Displacement Raft to Support Power Plant in India..... 75

A New Approach to Pavement Design.....F. N. HVEEM 77

DEPARTMENTS

Construction Trends	43	New Products	85
Construction Week	45	Manufacturers' Publications	94
Editorials	47	Manufacturers' Activities	98
News of the Week	49	Men and Jobs	114
Field and Office	78	Elections and Activities	118
Reader Comment	79	Obituaries	126
Book Reviews	80	Construction Reports	153

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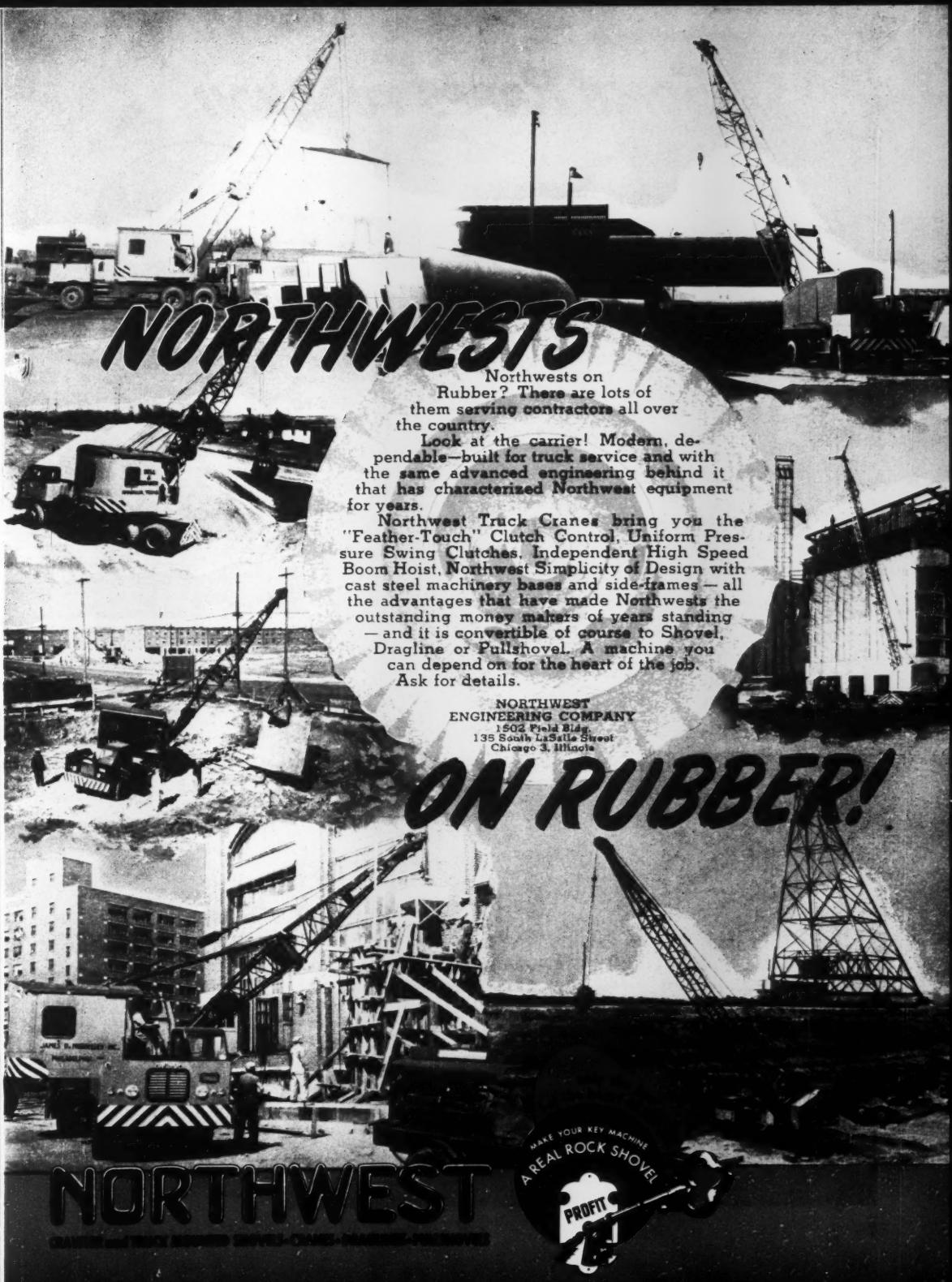
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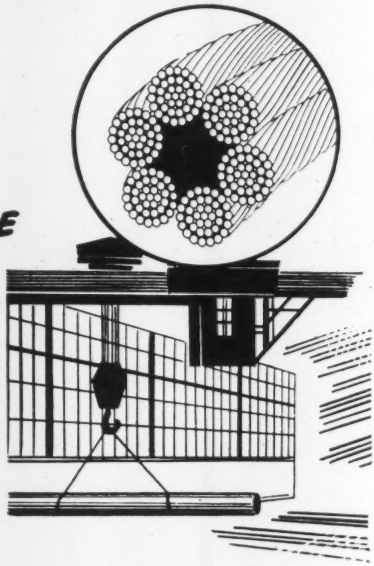

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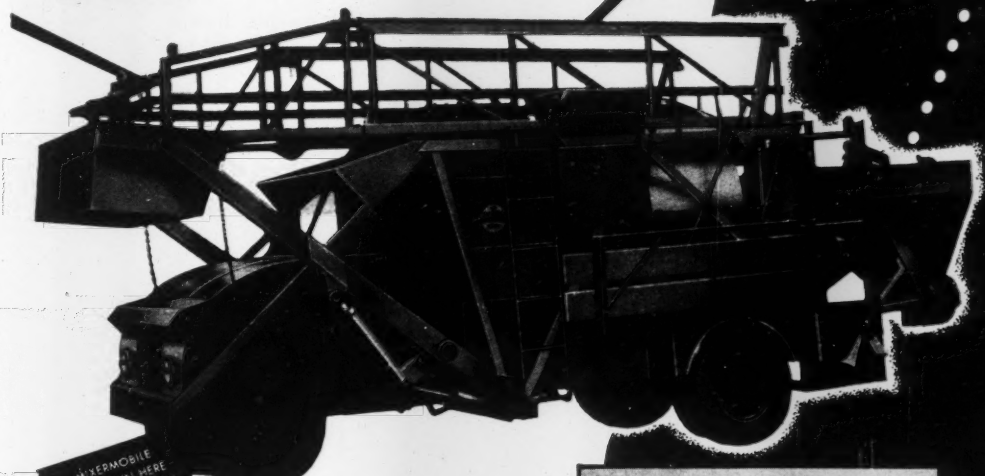
A complete mobile concrete mixing unit and elevator



MIXERMOBILE AS SHOWN HERE IS FOLDED—READY FOR TRAVEL

GREATER PROFIT ON EVERY JOB...

The new one-yard Mixermobile Model M-6 built to fit all jobs, both small and large. Its complete mobility means more jobs covered every day.

SAVES money by using dump trucks—mixes concrete on the job.

SAVES cost of erecting tower—35-ft. tower attached.

SAVES cost of hoist and storage hopper—included with tower.

SAVES time—drive to the job, ready to mix in five minutes. When pouring is finished drive to next job.

Turns out 200 cubic yards of concrete per day.

Use MIXERMOBILE — the most economical method of handling concrete on the job. Cuts labor costs—no time wasted waiting for concrete. One man operates complete unit.

FEATURES: HYDRAULIC CONTROLS.

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WEIGHT— 20,000 lbs.

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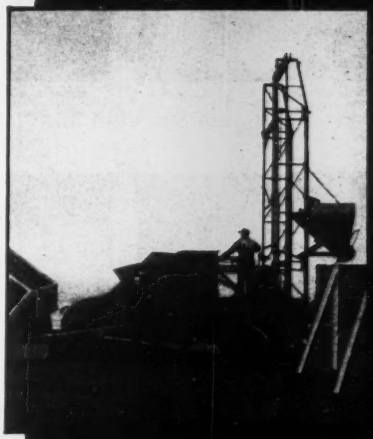

- 35-FT. TOWER lifts concrete in hoist bucket and empties into tower hopper. Eliminates cost of cranes and moving to and from the job. Extension may be had by special order.
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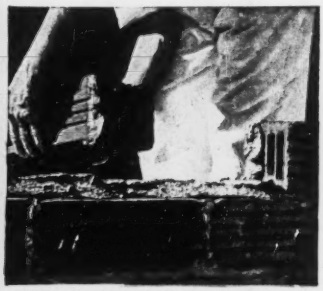
GET BETTER TILE AND BLOCK-WORK with BRIXMENT!

Tile or block-work offers very little protection against the penetration of water, unless both inside and outside head joints are completely filled with mortar.

In laying clay tile, or concrete or cinder block, even when they are used only for back-up work, especial care should be taken to secure full head joints on both the inside and the outside edges of the unit. Either of the following two methods may be used:

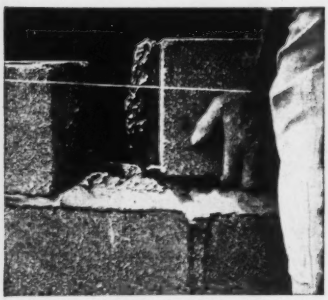
Method 1. Full head joints should be thrown onto both edges of the tile to be placed, or—



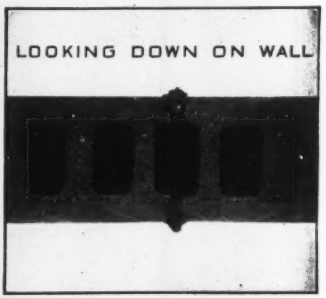
Method 2. A full head joint should be thrown onto one edge of the tile in place and also onto the opposite edge of the tile to be placed.

Enough mortar should be used to cause excess mortar to ooze out of the joints on both sides of the tile.

Method 1. Full head joints should be thrown onto both edges of the block to be placed, or—



Method 2. A full head joint should be thrown onto one edge of the block already in place and also onto the opposite edge of the block to be placed.



Enough mortar should be used to cause excess mortar to ooze out of the joints on both sides of the block.

One of the reasons bricklayers prefer Brixment mortar is the way it *sticks* to the tile or block, as shown above. It "stays put." The bricklayer does not have to stoop to the board for more mortar. *You* get a stronger, more water-resistant wall. ● Brixment mortar is easier to work, saves time, effort, and money. In addition, it has higher water-retaining capacity, greater bonding quality, is more durable. It is this *combination* of advantages that has made Brixment the largest-selling masonry cement on the market.

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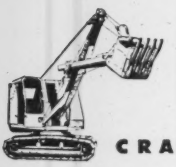

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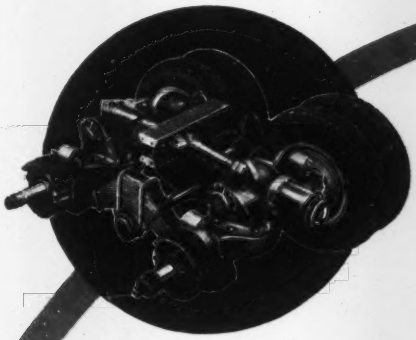

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On Garrison Dam It's

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EUCLID

EUCLIDS

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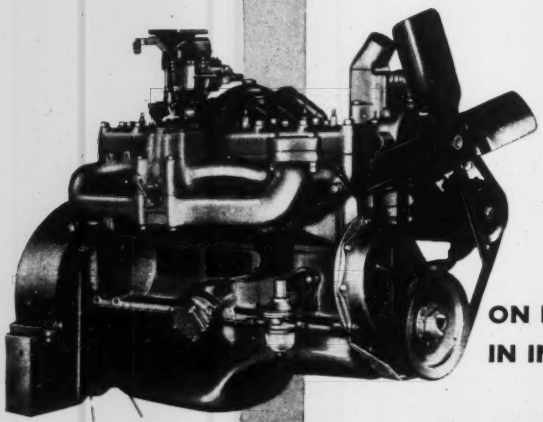
The EUCLID ROAD MACHINERY Co., Cleveland 17, Ohio

Move the Earth



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ON FARMS—IN FORESTS—IN OIL FIELDS
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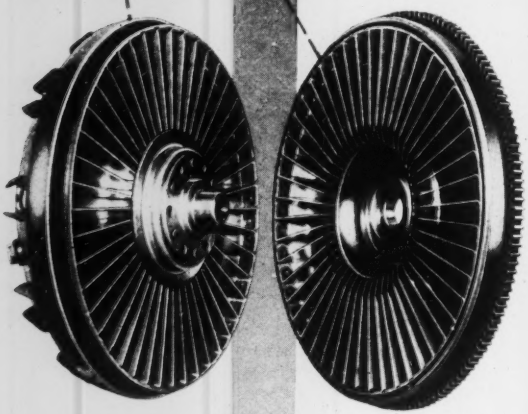
Now available with *gýrol* Fluid Couplings!



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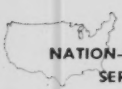

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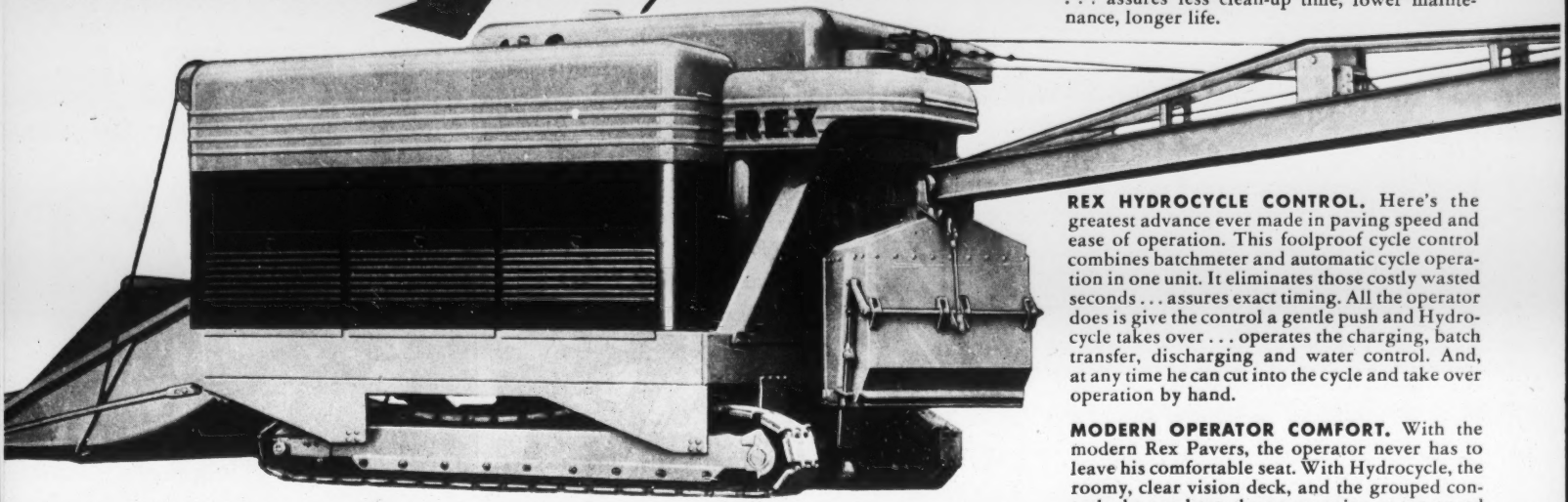


REX HYDROCYCLE CONTROL. Here's the greatest advance ever made in paving speed and ease of operation. This foolproof cycle control combines batchmeter and automatic cycle operation in one unit. It eliminates those costly wasted seconds . . . assures exact timing. All the operator does is give the control a gentle push and Hydrocycle takes over . . . operates the charging, batch transfer, discharging and water control. And, at any time he can cut into the cycle and take over operation by hand.

MODERN OPERATOR COMFORT. With the modern Rex Pavers, the operator never has to leave his comfortable seat. With Hydrocycle, the roomy, clear vision deck, and the grouped controls, he can keep the paver going at top speed all day long with far less effort.

AND MODERN simplicity of design, rugged construction, modern ease of spreading, husky crawlers . . . there's a whole host of features it will pay you to check. For all the facts, see your Rex Distributor or write Chain Belt Company, 1633 W. Bruce St., Milwaukee 4, Wis.

• 34E SINGLE AND DOUBLE DRUM PAVERS

CHAIN BELT COMPANY . . . REX CONSTRUCTION MACHINERY

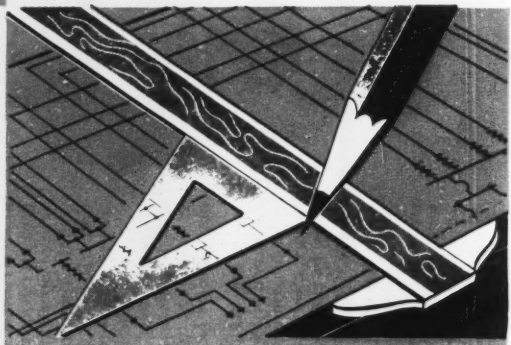
How building designers can get an **electrical layout that fits** ...and save time and money doing it!

1 Before your draftsman touch pencil to paper, call, wire or write your nearest General Electric Office; an experienced building specialist will contact you.

2 Outline to him your preliminary plans and problems; show him the type and location of all electrical loads, special conditions which must be met.

3 At his disposal are many General Electric product engineers . . . authorities in the fields of power distribution, lighting, motors and control.

RESULTS: You save planning time and come up with electrical plans that fit your structure . . . plans that embody all up-to-the-minute electrical developments . . . specifications that assure the building owner maximum operating economies over the years, and establish your reputation for future jobs. Try this easy, 4-step planning method on your next job . . . you'll find it both profitable and enjoyable to work with a General Electric building specialist. ***Apparatus Dept., General Electric, Schenectady, N. Y.***

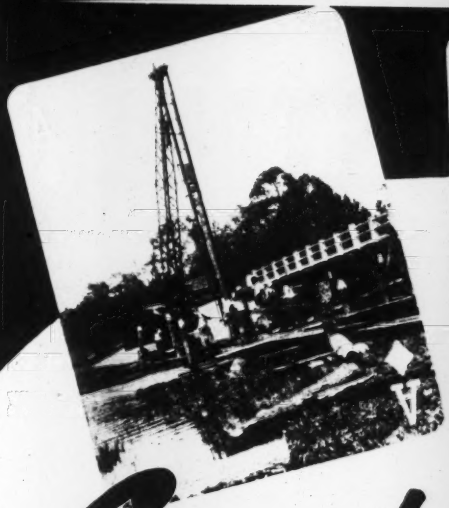


4 Using this wealth of G-E know-how, he will help you plan an integrated electrical system, around which you can easily draw up plans and specifications.

Electric Equipment for Commercial Building

GENERAL ELECTRIC

665-106



Grand Slam

in bridge building with TL-20 CRANEPOWER

Goodwyn & Murphree, Troy, Alabama, own 4 Lorains . . . "trump" construction costs on bridge job with 1 Lorain TL-20 Crane

Here's how Goodwyn & Murphree made a "Grand Slam contract" on a bridge building job near Red Bay, Alabama.

Leading with a TL-20, one of four company-owned Lorains, the contractors "finessed" every operation and "trumped" construction costs on every count with this power-packed, versatile machine and its various crane attachments.

Tricks taken by the TL-20 as shown by the photos—top left: TL-20 crane, equipped with 1250 lb. drop hammer, drives 75 ten-inch piles to 10 ft. depth in 10 hr. day for two cofferdams below water level. Top right: Swinging the concrete mixer into place. Center: Pouring concrete into forms. Bottom right: Working as a dragline to dig foundation for a concrete form.

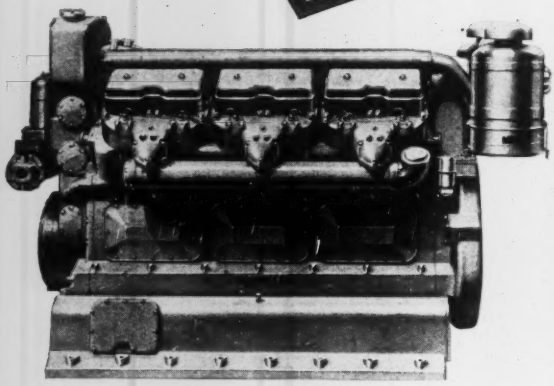
This is one of hundreds of construction jobs where the TL-20 is taking extra tricks in production with its labor-saving selection of boom equipment and choice of either crawler or rubber-tire mountings. For this peppy, multi-purpose machine provides over 50 possible combinations to fit your job conditions . . . a full "deck of aces" for a profitable operation. Let your Thew-Lorain Distributor deal you all the facts on this money-making machine—today!

THE THEW SHOVEL CO.
LORAIN, OHIO
Cable Address: UNLOADER

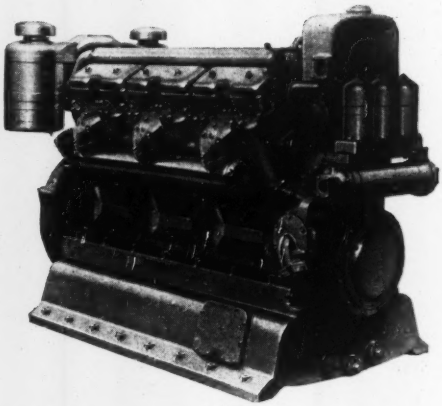
Lorain® Thew TL 20 Lorain

...STILL

WHEN YOU THINK OF INDUSTRIAL AND CONSTRUCTION POWER, THINK OF THE BIG YELLOW ENGINES THAT SUPPLY SO MUCH OF IT



"CATERPILLAR" DIESEL D397 ENGINE—500 hp. (max.) at 1200 rpm. V-12—5¾" bore x 8" stroke. Equipped with blower.



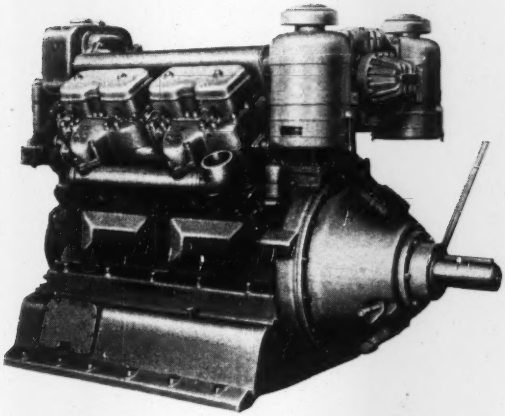
"CATERPILLAR" DIESEL D386 ENGINE—400 hp. (max.) at 1200 rpm. V-12—5¾" bore x 8" stroke.

Now you can power your larger machines with available new-size engines that extend the range of "Caterpillar" Diesels to 500 horsepower. These bigger "yellow engines" are designed, built and job-tested with the same exhaustive thought and care that have enabled thousands of their older family members to run up records of forty, fifty and even seventy thousand hours of dependable operation. They have the same ruggedness, the same efficient fuel system and fuel economy, the same high all-round quality that have made "Caterpillar" Diesels world famous for low lifetime cost-per-hour.

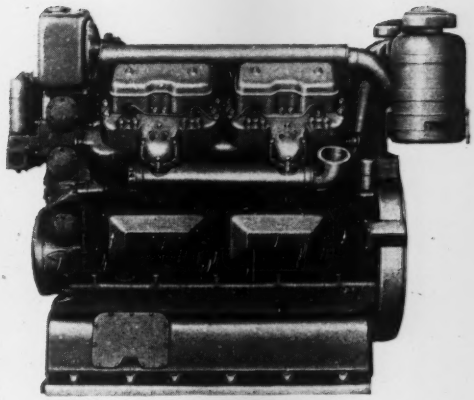
When you need a bigger or more powerful shovel, dredge, ditcher, crusher, asphalt plant, or other piece of heavy power equipment, specify these bigger yellow "Caterpillar" Diesels. Let your "Caterpillar" dealer give you full information on these new engines. He is as near as your telephone.

CATERPILLAR TRACTOR CO. • PEORIA, ILLINOIS

BIGGER YELLOW ENGINES ...FOR YOUR LARGER JOBS



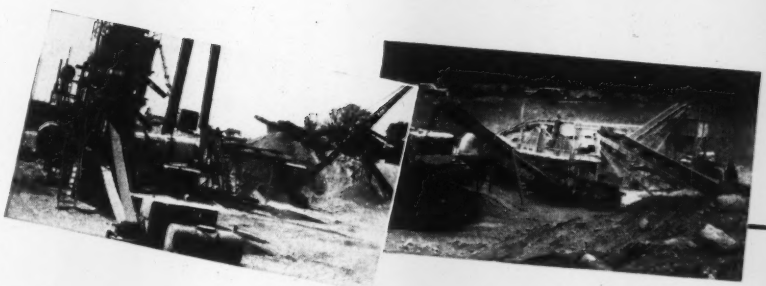
"CATERPILLAR" DIESEL D375 ENGINE—335 hp. (max.) at 1200 rpm. V-8—5¾" bore x 8" stroke. Equipped with blower.



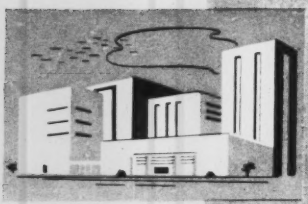
"CATERPILLAR" DIESEL D364 ENGINE—265 hp. (max.) at 1200 rpm. V-8—5¾" bore x 8" stroke.

CATERPILLAR DIESEL

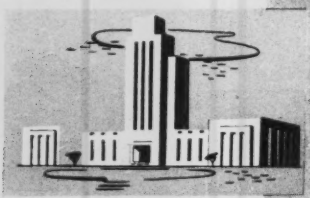
REG. U. S. PAT. OFF.



ENGINES
TRACTORS
MOTOR GRADERS
EARTHMOVING EQUIPMENT

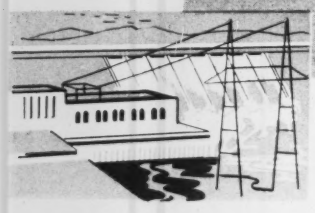


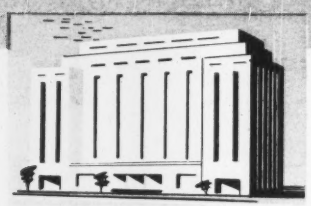
The Construction Industry



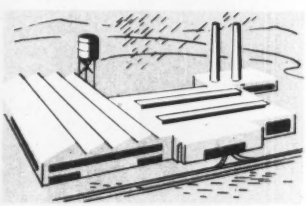
...needs the experience of

FORT PITT BRIDGE





ALL OVER AMERICA—institutions, hospitals, industrial and power plants, schools, hotels and bridges are under construction—and for the structural steel fabrication FORT PITT BRIDGE is an excellent, experienced source of supply.



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"Steel Permits Streamlining Construction with Safety, Endurance and Economy"

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NELSON "Top-Side" Method Cuts Roofing Application Costs!

Produce Better Jobs! Apply Corrugated Iron, Aluminum, or Protected Metal with NELSON "RIVWELD" STUDS

Roofing contractors are *staying on top of the job* with the Nelson "Rivweld" method of fastening. The result, in every case, is a better job, done faster, at substantial savings in cost.

Because all work is done entirely from the top-side of the roof, no inside scaffolding or rigging is required, no workmen are needed under the roof.

In this simplified "production line" method, Nelson "Rivweld" rivet studs are quickly end-welded to the purlins with the lightweight Nelson Gun. The corrugated metal is then impaled over the rivet extensions which are upset to form a weathertight job.

TYPICAL RESULTS: One contractor reports a saving of over $2.00 per square in applying corrugated iron roofing to a large factory building. Another contractor writes: "Our cost records show we have saved a minimum of 20% in application costs on every one of the scores of jobs on which we've used the Nelson method."

The Nelson Method of Fastening is also widely used for applying corrugated asbestos roofing and siding; for installing sprinkler and piping systems; conduit and wireways; insulations of all types.

RENT IT—TRY IT! Nelson Stud Welding equipment may now be rented for only $45 a month. Use the coupon to get complete details about this plan and the Nelson cost-saving method of fastening.

NELSON STUD WELDING

Division of Morton Gregory Corporation
2751 Toledo Avenue Lorain, Ohio

NELWELD

NEW COMPOSITE STUD

for applying Corrugated Aluminum roofing and siding prevents corroding. Made up of a cadmium-plated flux-filled mild steel base or body and an aluminum insert. An aluminum washer is placed over the stud before the latter is riveted over to secure the sheet. This construction practically eliminates the possibility of electrolytic action.

GET ALL THE FACTS NOW!

NELSON STUD WELDING
Division of Morton Gregory Corporation
2751 Toledo Avenue, Lorain, Ohio

Send complete information about Nelson Stud Welding for the following roofing and siding materials:

- ☐ Corrugated Iron
- ☐ Corrugated Aluminum
- ☐ Corrugated Protected Metal
- ☐ Corrugated Asbestos

*Name*_____

*Company*_____

*Address*_____

*City*_____ *State*_____

There's a Macwhyte Rope that's the right rope for your equipment

All job-proved—a thousand and one wire ropes to choose from

For easy handling and longer service use PREformed Whyte Strand—it's internally lubricated.

Ask a Macwhyte representative to recommend the rope best suited for your equipment.

Macwhyte Wire Rope

MACWHYTE COMPANY

2930 Fourteenth Avenue, Kenosha, Wisconsin

Manufacturers of Internally Lubricated Wire Rope, Braided Wire Rope Slings, Aircraft Cables and Assemblies, Monel Metal and Stainless Steel Wire Rope.

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● You'll be able to move Byers Traveler *where* and *when* its versatile services are required! It's always ready to go..

On or off the highway, the Traveler propels itself under the direction of one man only . . . the operator.

Around the job, you'll find it fast, powerful and adaptable to most every job condition. It handles all boom attachments equally well, performing many tasks not adapted to a crawler rig or to a long-chassis-two-man* rubber tired crane or shovel.

These differences add up to make Byers Traveler a profitable machine to own and use. Ask your nearby Byers distributor for the new complete ½ or ⅝ yd. Traveler catalog, just off the press.

THE BYERS MACHINE CO., Ravenna, Ohio
Distributors Throughout the World

*Also available from Byers if you prefer it.

Typical Traveler job . . . **pick it up here, carry it anywhere, set it down there.**

INQUIRE TODAY

BYERS TRAVELER

BRUNING BW WHITEPRINTER 93

VOLUMATIC MODEL

Now *all* your departments can handle their copying jobs with a single versatile machine: the Bruning Whiteprinter, Volumatic Model 93. This brand new machine at last provides you the necessary volume and high speed (up to 105 sq. ft. per minute). At the same time, through simpler operations and less wastage, it reduces copying costs.

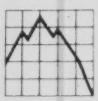
The Volumatic produces sharp, highly legible copies of engineering drawings, documents, or *anything* that is printed, drawn, written, or typed on a translucent medium. It copies charts, plats, letters, invoices, financial reports—and many other items. Its operation is so simple that a girl can learn to run it in less than an hour.

The Volumatic takes cut sheets or roll stock with equal facility. It produces sharp BW Prints from post card size up to 42 inches wide and of unlimited length. You can have light, medium, or card-weight BW Prints; BW Prints on tinted stocks; BW Prints on film or cloth; or BW Prints with colored lines. BW Prints are delivered front or rear, neatly stacked.

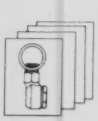
CHECK THESE BW ADVANTAGES

No vents or exhaust fans: The Bruning Model 93 is completely odorless . . . can be used anywhere in the office without the slightest offense.

No plumbing connections: There are no pipes to connect, no water to supply or drain away. The Model 93 is mounted on casters, is moved where needed.



Built-in transformer: The Model 93 is the first large volume whiteprinter which protects you against voltage fluctuations common to power lines. Assures longer lamp life, more uniform prints, as well as savings on BW Materials.



Uniform developing: Both sides of the print receive a thin, measured film of BW Developer Solution at once. This assures flat prints, never under- or over-developed.

Send today for full information. Let us send you a file of literature describing the new BW Volumatic Model 93 and other Bruning Whiteprinters, and the BW Mediums you can use with them. See for yourself the extreme versatility, economy, and speed of these machines. There is no obligation.

Charles Bruning Company, Inc.

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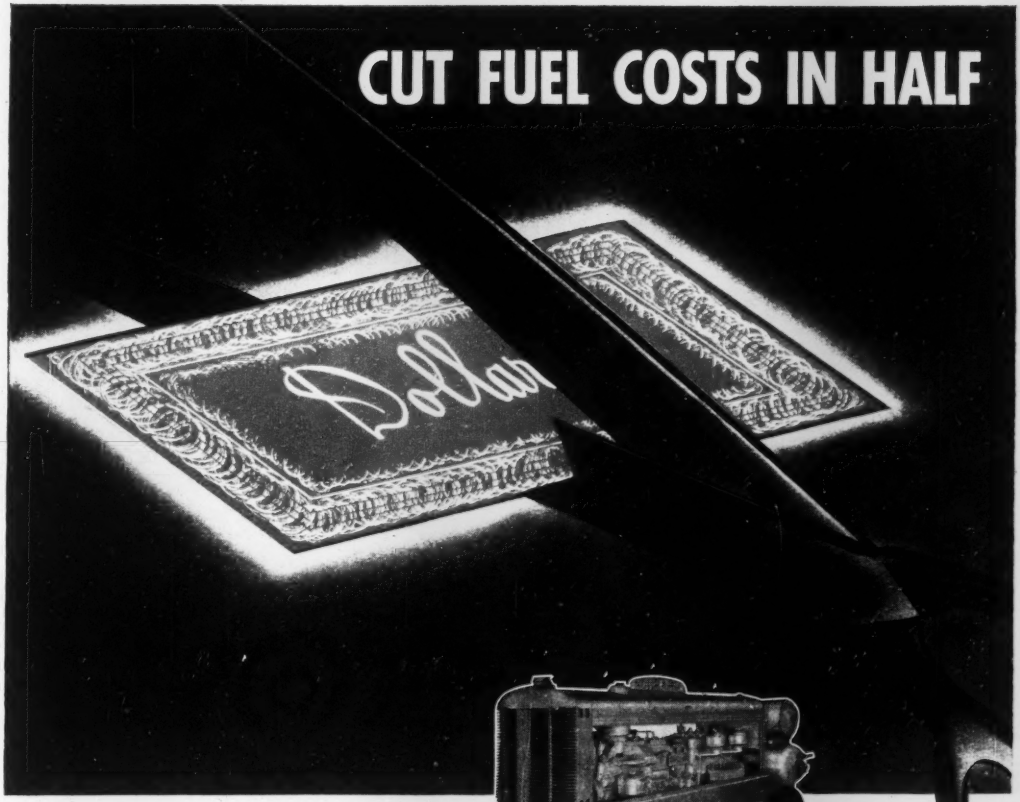
Drafting Room Furniture • Slide Rules
Surveying Instruments • and many others.

CUT FUEL COSTS IN HALF



with the SCHRAMM *Pneumastat*

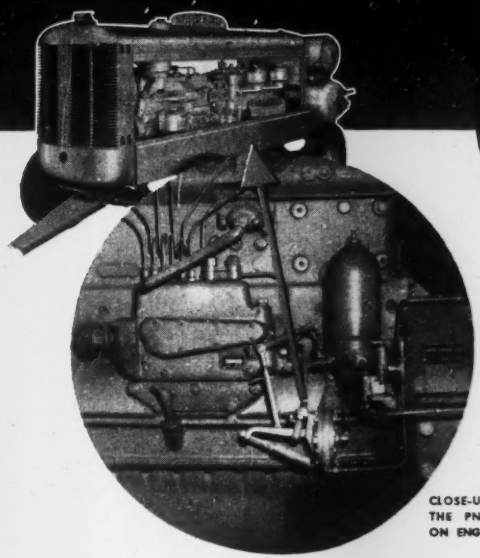
YES, this saving is now possible with the new feature of the Schramm Air Compressor . . . the Pneumastat!

The Pneumastat assures you of *infinitely variable speed* and the elimination of continuous loading and unloading. The result is an *even flow of air* regardless of how variable the compressor load might be!

Other advantages offered by the Pneumastat are:

- ✓ Higher average working pressure—more work from your tools.
- ✓ Simple and rugged . . . no valves, no checks, no pistons.
- ✓ Longer compressor and engine life.
- ✓ Lower maintenance costs.
- ✓ Requires no service or adjustment.

COMPLETE DETAILS ON REQUEST, WRITE DEPT. AOW.



CLOSE-UP VIEW OF THE PNEUMASTAT ON ENGINE BLOCK

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THE COMPRESSOR PEOPLE • WEST CHESTER • PENNSYLVANIA

"Stay out of here folks.... this hot stove will fry you!"

WHEN the first gas range, with its promise of a cool kitchen, was exhibited at the Philadelphia Centennial Exposition in 1876, little did its sponsor dream of a market of 21,000,000 homes. For that is the extraordinary number of residential customers now served by gas for cooking, refrigeration, or home heating.

Water supply and sanitation also made extraordinary progress in the half-century since 1899, the year our Company was established. Today, 12,000 water works furnish 85 million people with a dependable supply of safe, palatable water. Over 5,000 sewage treatment plants contribute to the health of the nation.

In these three progressive branches of public service—gas, water supply and sanitation—are customers who have been buying pipe from us for 50 years. They know that we, also, have made signal progress, from decade to decade, in developing and perfecting better methods for the production of better pipe.

To those responsible for the great progress in water supply, gas and sanitation service and their contribution to better health and living over the past fifty years, America pays tribute.

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1899-1949

U. S. Pipe & Foundry Co.

Makers for 50 years of cast iron pipe for water, gas and sewerage service.

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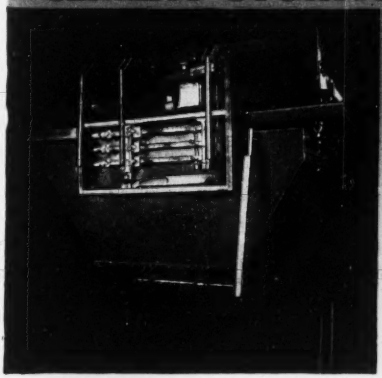

ERIE'S AggreMeter Line, backed by over a quarter century of application experience, is at your service. From the smaller GA Portable AggreMeters to the largest of central plants that combine Aggregate and Bulk Cement handling, Erie is prepared to meet your needs. May we direct you to some Erie AggreMeter installation near you, or let's have your immediate problem for recommendations. We list standard plants, left below. Write for bulletins.

NEW BWC AGGREMETERS

ERIE presents this new sturdy all-welded, easy operating line of weighing AggreMeters. They feature new type scale suspension with few parts. Erie's distinctive discharge method is well known for fast charging service. Type BWC units are available in 1 1/2, 2, 3, 4, and 5 cu. yard sizes.

OTHER ERIE AGGREMETERS

TYPE GA
Portable Plants
36, 52, and 68 cu. yard sizes

TYPE CAB
3-Compartment
74, 88, 107, 129, 150, and 211 cu. yard sizes

TYPE CTB
Like Type CAB
Only with Long Columns

TYPE CTE
4-Compartment-in-Line
145, 160, and 200 cu. yard sizes

TYPE CTC
Like Type CTE
Only with Long Columns

TYPE M
Portable Cement Bins
Single Compartment
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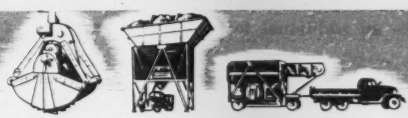
TYPE L
Single and Double Compartment
90, 112, and 148 cu. yard capacity

ERIE

STEEL CONSTRUCTION COMPANY

194 GEIST ROAD • ERIE, PENNSYLVANIA



Conveyor efficiency starts here

Your conveyor can be no better than its idlers!

For the idlers must do two things: (1) They must withstand severe usage. (2) They must keep your conveyor belt tracking properly. Otherwise, your entire conveyor can break down.

Yes, efficient idlers are vital to top performance. And because Hewitt-Robins Conveyors are equipped with Robins Idlers, you can depend on them to *move your material at less cost.*

You see, Robins Idlers provide *extra strength.* The reason is their rigid truss design. It is stronger than any other type of construction!

Robins Idlers provide *extra economy,* too. That is due to such features as their patented One-Shot Lubrication and Triple Grease Seal. These enable Robins Idlers to roll longer . . . with less care and less grease!

Here's an additional fact to keep in mind when you buy a conveyor:

Hewitt-Robins is the only company in the world that assumes complete responsibility for both machinery and belting. Only Hewitt-Robins engineers builds and installs these elements as a single unit.

Whether you need replacement idlers for your present conveyor or an entirely new conveyor, insist on Robins Idlers. For full details, write Robins Conveyors Division, 270 Passaic Avenue, Passaic, New Jersey.

ROBINS IDLERS

ROBINS CONVEYORS DIVISION

These exclusive features of Robins Idlers save you money

One-Shot Lubrication

Cuts your lubricating time more than half. Assures thorough lubrication with only one walkway on your conveyor. No exposed piping subject to damage.

Triple Grease Seal

on Robins Roller Bearing Troughing and Return Idlers. Locks grease in. Keeps dirt and moisture out.

Rigid Truss Construction

End and center brackets, pulleys and pulley shafts form a single unified member that absorbs shocks and loads. Stronger than any other type of construction!

HEWITT-ROBINS HR **INCORPORATED**

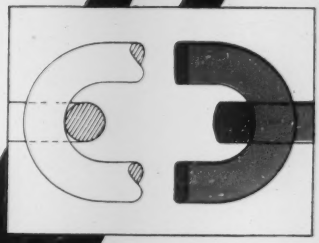
Keep your Dragline Buckets on the job with

ESCO WORK-PROVED REPAIR PARTS

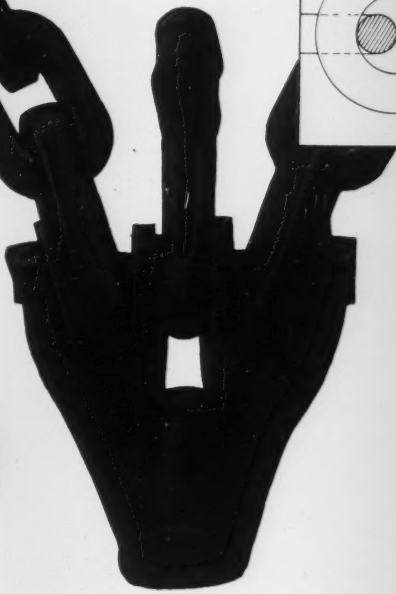
A swift return to the job and renewed production is possible when you use *ESCO* Manganese steel repair parts. These are designed to produce maximum payloads and to last on the job. They may be used with all standard makes of buckets.

Typical of these parts is the *ESCO* flat side drag chain. It is composed of solid cast links, made of shock and wear resisting manganese steel. They become harder and tougher with use. Extra steel is placed where greatest wear occurs. Designed for full surface contact, *ESCO* chains don't have to "take a seat."

With conventional round link chain, contact is at one restricted point only, which wears chain rapidly and reduces strength.



Flat surface of links distributes wear over maximum area. With wear decreased correspondingly, chain outlasts other types.



Other ESCO Accessories for Greater Production

- Box-type Points and Adapters
- Hoist Chains
- Pear Links
- Rope Sockets
- Weld-on Tooth Points
- Spreader Bars
- Drag Cluster Rigging

ESCO Repair Links for Rugged Service

Simple in construction, and easy to use, *ESCO* hinge repair links are made of manganese steel, with a high alloy steel pin. They are flexible in use, with strength enough for severe service.

ESCO catalog 108H contains sizes, dimensions, and other detailed information on these accessories. Get your copy from your nearest *ESCO* office or use the coupon. Electric Steel Foundry, 2167 N.W. 25th Ave., Portland 10, Oregon; 716 Porter St., Danville, Illinois. Offices in Pottsville, Pa.; Eugene, Oregon; Chicago; Honolulu; Houston; Los Angeles; New York; San Francisco; Seattle; Spokane. In Canada, *ESCO* Limited, Vancouver, B.C.

ESCO

DIPPER AND DRAGLINE BUCKETS

ELECTRIC STEEL FOUNDRY
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Address _____ Zone _____

City _____ State _____

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for all-around best performance on DEMOLITION and FOUNDATION JOBS

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JOY K-81, a rugged tool capable of sustained operation on the heaviest demolition work.

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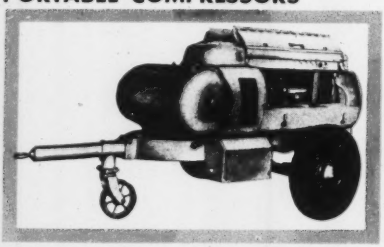
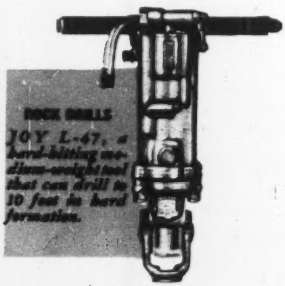
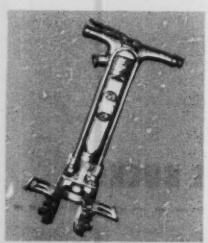




ROCK DRILLS

JOY L-47, a hard-hitting medium-weight tool that can drill to 10 feet in hard formation.



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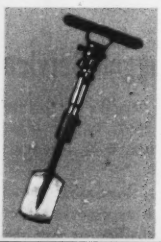

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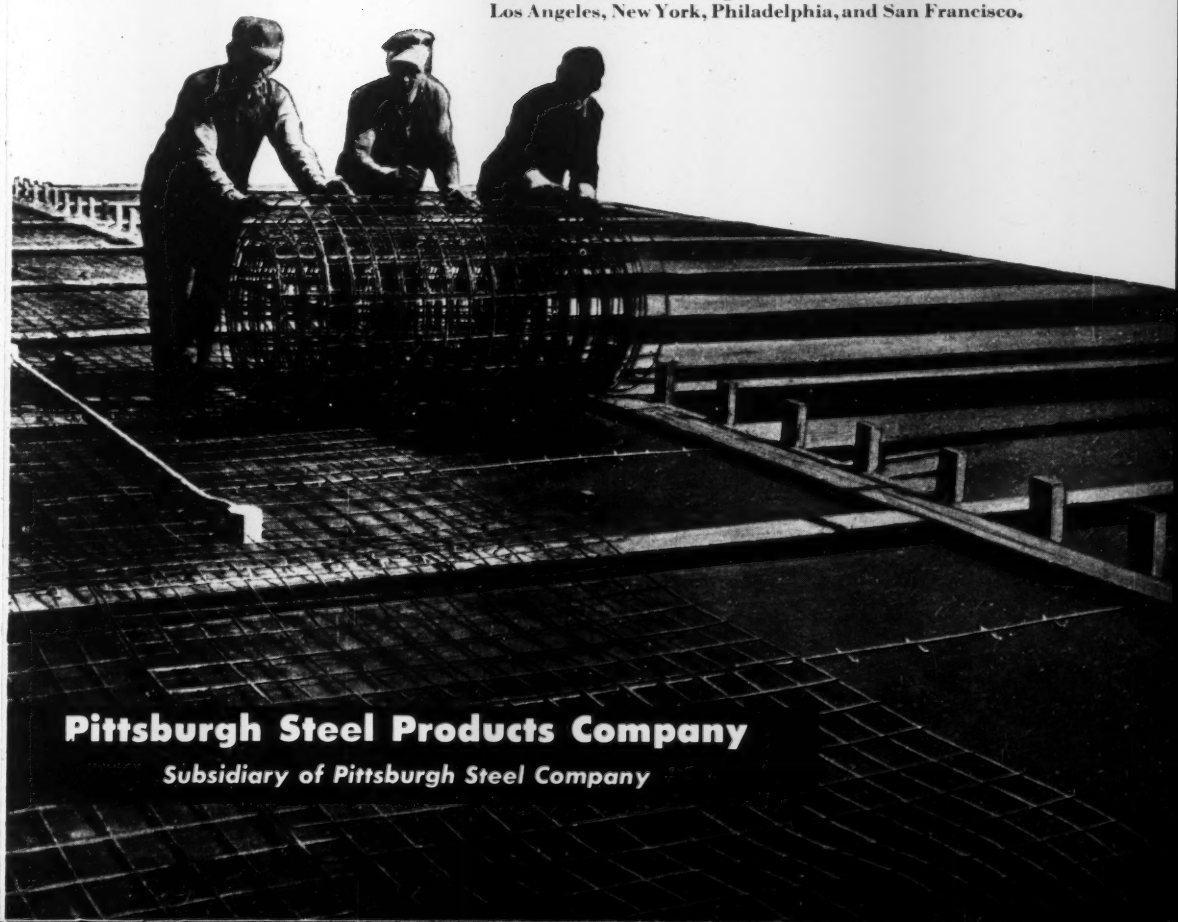

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ROCKMASTER Detonators

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ROCKMASTER is designed to "fit like a glove" these other Atlas developments that have made Atlas a leader in the field of explosives. Your Atlas representatives will be glad to show *you* how to make the most of ROCKMASTER advantages.

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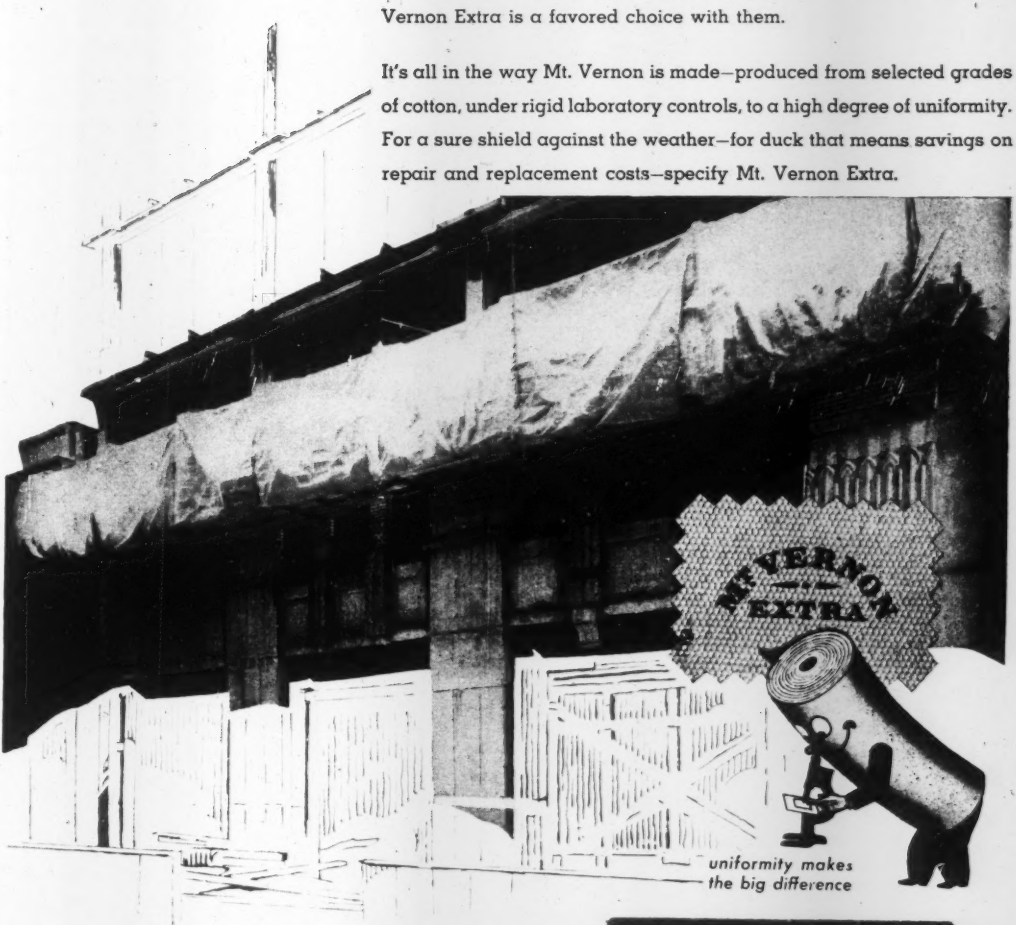

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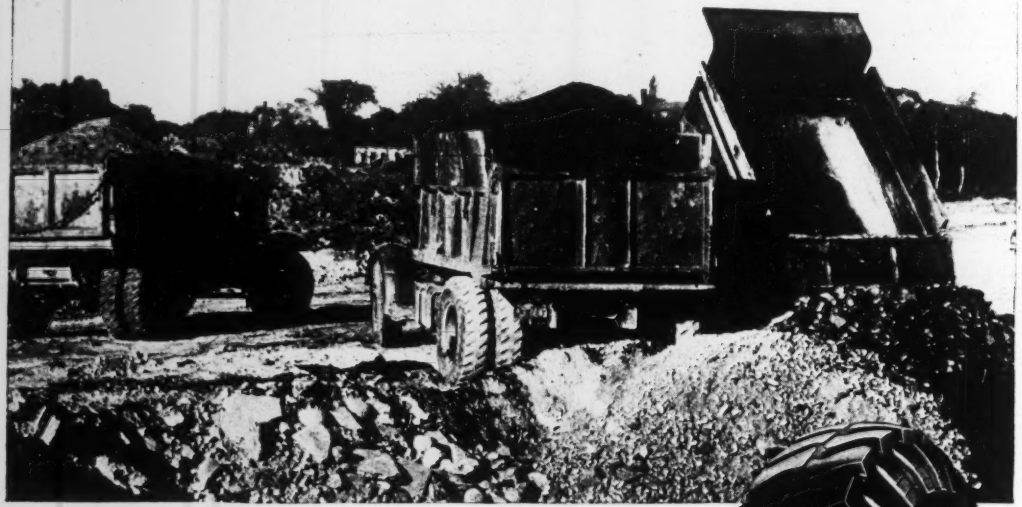

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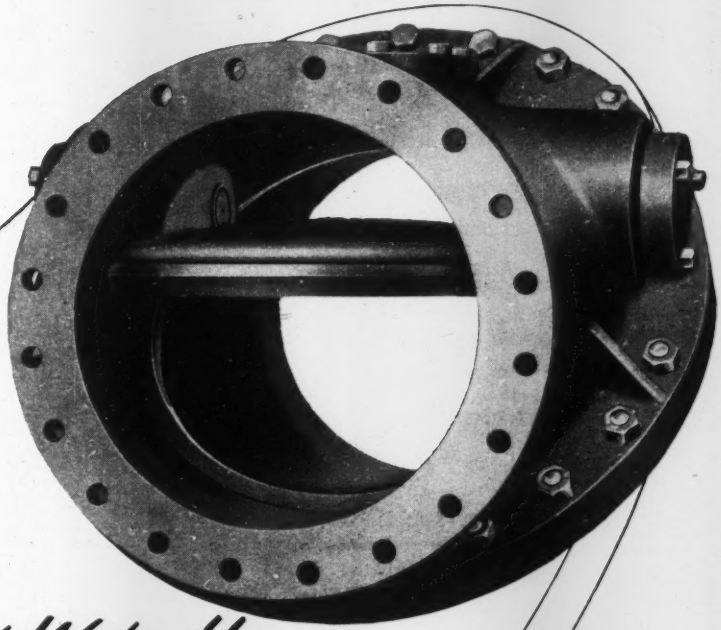

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Chapman Tilting Disc Check Valves *work with . . . not against . . . the stream.* As a result, destructive pipe line stresses are practically eliminated. Head losses, as compared with conventional type check valves, are reduced 65% to 80%.

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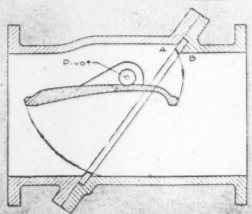

Cross-section of the Chapman Tilting Disc Check Valve illustrating the way that the balanced disc is supported on the pivot, with arrows showing the travel of the disc. A feature of the design is that the disc seat lifts away from the body seat when opening, and drops into contact when closing, with no sliding or wearing of the seats.

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buy in excavators because . . .

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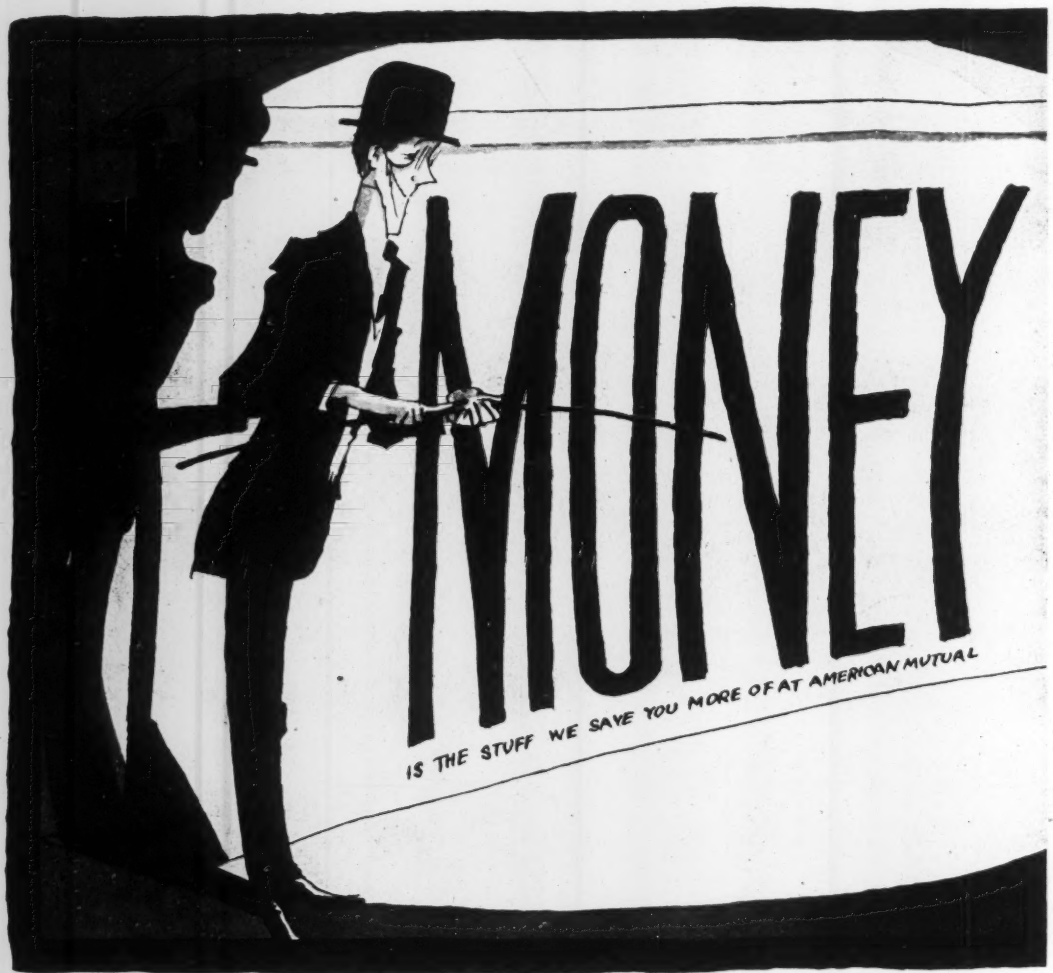

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While we're helping reduce accidents and premiums, we show you ways to speed up work and cut down on lost time.

So you make more money . . . Have another yacht on us!

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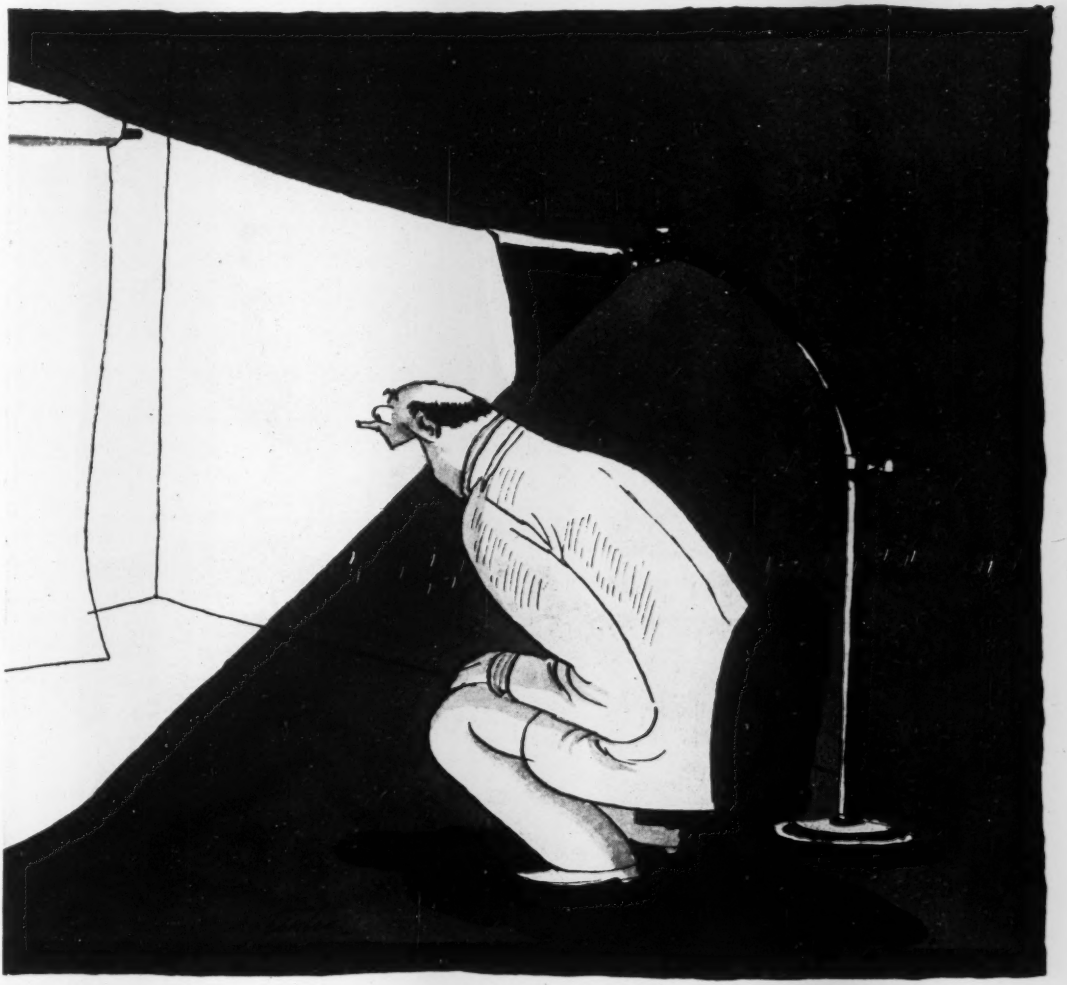
FIRST LINE . . . by Mr. Friendly



And all this service is included at no extra charge with every industrial policy.

But hold your breath! Here's the best part . . .

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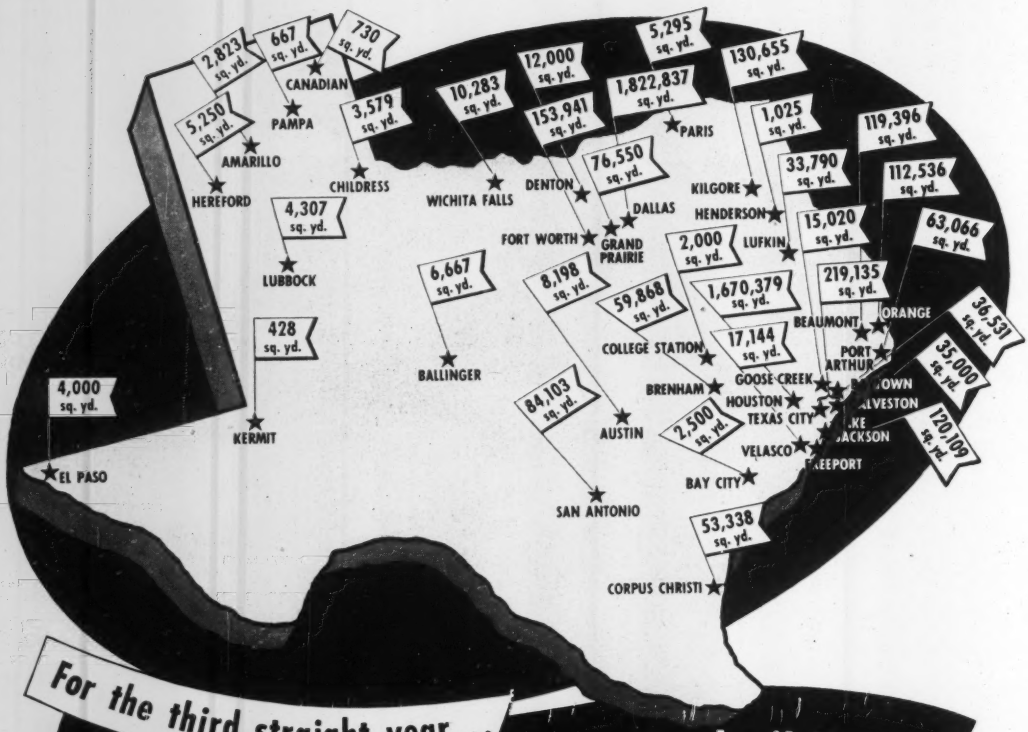

For the third straight year...
TEXAS leads the nation in building CONCRETE STREETS AND ALLEYS

IN 1948, for the third consecutive year, Texas cities built more concrete streets and alleys than cities in any other state. This three-year leadership is the result of paving programs in 35 cities, whose individual yardage is shown on the map.

These cities, building for the future, have placed the following yardage of long-lasting, economical concrete pavement in the last three years:

1946	853,019 sq. yd.
1947	1,657,782 sq. yd.
1948	2,382,349 sq. yd.
Total	4,893,150 sq. yd.

If this tremendous yardage of durable concrete pavement were placed in one continuous 20-foot highway it would extend nearly 420 miles from Laredo to Fort Worth or Dallas. This program demonstrates a state-wide recognition of concrete as the pavement that serves taxpayers and motorists best over the years.

In other states hundreds of progressive cities are also building durable streets—and saving taxpayers money—by paving with concrete. Concrete is ***low-annual-cost*** pavement because it usually costs less to build than any other pavement of equal load-carrying capacity, costs less to maintain and lasts longer.

Concrete streets and alleys are easier to keep clean. They are easier to illuminate. They are much safer. Write today for a free copy of "*Design of Concrete Pavements for Municipal Streets.*" Distributed only in the United States and Canada.

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A national organization to improve and extend the uses of portland cement and concrete through scientific research and engineering field work

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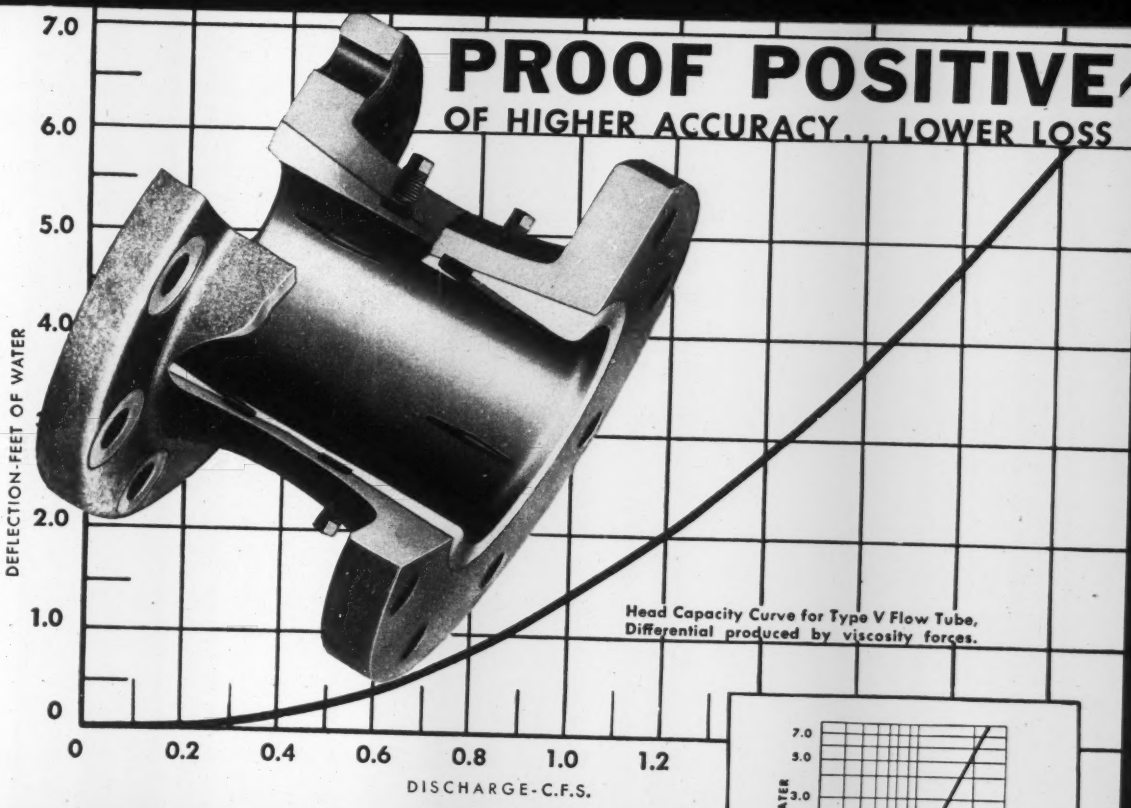
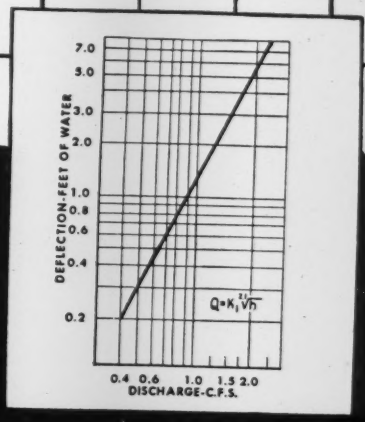


Head Capacity Curve for Type V Flow Tube, Differential produced by viscosity forces.



Log Plot of Head Capacity Curve.

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PROVES CONSTANT COEFFICIENT OVER 8:1 RANGE OF DISCHARGE

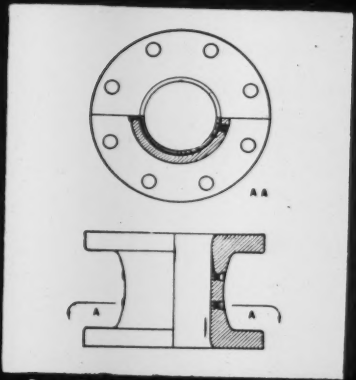
Now! The new Bethlehem Flow Tube—for large savings in power . . . higher product quality . . . large installation savings—offers proof positive of consistent accuracy.

In calibration tests conducted by an independent hydraulic laboratory—one of the foremost in the country—the Bethlehem Flow Tube held its high accuracy to the limit of the testing apparatus. Discharge plotted against head proved that differential head is in all cases proportional to a constant power of velocity . . . that discharge coefficient is constant over *an 8:1 range of discharge.*

Add to this: one pipe diameter length . . . negligible resistance to flow in most installations . . . minimum straight run limitations after elbows and similar fittings . . . measurement of gases without consideration of compressibility factors and the Bethlehem Flow Tube becomes an outstanding improvement wherever it is necessary to measure or control fluid flow

Find out the details of its revolutionary operation now! Write for the folder, "Bethlehem Flow Tube."

*GENTILE PATENTS



Cross-Section of Type V Flow Tube. Pat. No. 2,260,019. Other patents pending.

BETHLEHEM FOUNDRY & MACHINE CO., BETHLEHEM, PA.

GEARED to the Concrete

The deep, reversed, double-helical ribs of Inland HI-BOND reinforcing bars grip the concrete with an interlocking action that provides unequaled bonding strength.

Engineering tests have proved that straight embedments of HI-BOND have a greater bonding effectiveness than bent-bar anchorages of ordinary deformed bars. And, with ordinary bars, the low bonding strength of the bar has always been the weak link in the structure—the bar would slip before the steel or concrete could be fully loaded. With its high bonding strength, HI-BOND bars make it possible not only to use more of the potential strength of the steel but also to take advantage of the higher compressive strength of present-day concretes. As a result, HI-BOND is leading the way to radical revisions in present building codes.

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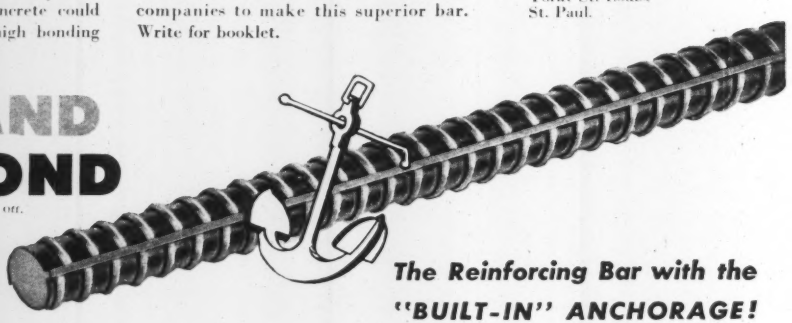

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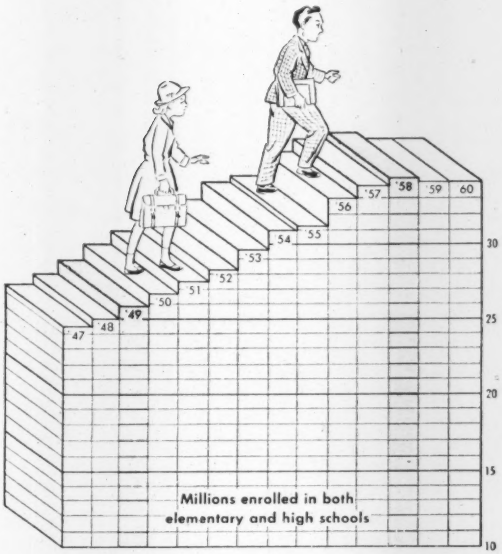
CONSTRUCTION TRENDS

HOW SCHOOL ENROLLMENT WILL BOOM



Boom in babies booms construction

Twelve billion dollars—$1 billion to be spent each year until 1960—is needed for a school expansion program, according to the American Association of School Administrators.

Overcrowding in existing schools and the prospect that there will be 10,000,000 more youngsters in school in 1958 than there are now, have made school construction one of the nation's emergency needs.

The AASA survey is the third by a national organization to be completed recently—and all three are in substantial agreement as to the need. A month ago the Office of Education of the Federal Security Agency reported that its figures indicate a need for $11 billion in new school construction (ENR March 17, p. 85), and last week the NEW YORK TIMES reported a need for $10 billion in new schools, after its own nation-wide check.

In New York City an investigating committee found a "major educational crisis" on which the city will have "to act and act fast". The jump in the city's birth rate during the war and postwar years will bring another 215,000 youngsters to swell the ranks of the children now crowding the city's schools. To meet their needs, the committee recommended adding 153 public elementary schools in the next five years. Later the wave of babies will flood into high schools, and the city will need another building program.

For the country as a whole, the National Education Association has estimated that one out of every five city schools is now badly overcrowded. This condition holds for all types of schools in all areas. Percentage of overcrowded schools among all schools ranges from 15 percent in junior high schools to 21 percent in senior high schools. New England and the Middle Atlantic states have the lowest proportion of overloaded schools —9 percent—and the Far West the highest, 31 percent. Those schools which are overcrowded on the average have 31 percent more students than they were built to handle.

Moreover, many school buildings are old and rickety. About 80 percent of all schools were built before 1930; 20 percent date back before 1899, and 2 percent go back to 1870 or more—almost to the Civil War.

That communities are beginning to do something about their schools—replacing fire-trap buildings and expanding systems—is shown in construction reports. This year about $700 million worth of public educational construction is expected to be put in place—about seven times as much as was done in 1946. But, obviously, a much bigger job must be done.

New ideas in schools

New York has proposed something new in school construction to meet the special needs of the 1950's—temporary buildings. School buildings almost everywhere are now built to last 50 years. But the birth rate, which jumped during the 1940's, will taper off. As that happens, school systems built to handle the rush of war and postwar babies, will find themselves over-expanded in the 1960's. So New York will build schools designed to last only a decade or so. Many other communities will meet the problem by keeping 50-year old schools in service and then tearing them down when the flood of students subsides 10 or 15 years from now.

Mass housing projects are giving New York, and other big cities, special problems. In the past, neighborhoods have grown only slowly. But with the coming of superhousing projects, the number of kindergarten-age youngsters in an area may jump 10 times in one year. That, obviously, calls for better coordination between builders and city authorities.

All this means new business for contractors. With schools becoming a number one problem for municipal authorities, the volume of school construction in many areas will multiply in the next five years.

Philadelphia finds the Answer

FOR BETTER WATER—WITH *Ozone!*

Installation of the world's largest Ozone plant is Philadelphia's answer to overcoming taste and odor problems in water drawn from *surface supplies.* This is one of the first major steps in this city's progressive, long-range water improvement program.

This new Ozone installation in the Belmont Filtration plant in Philadelphia currently treats about 36,000,000 gallons daily with an ultimate capacity of 70,000,000 gallons a day. It was designed, built and installed by The Welsbach Corporation after two years' of extensive tests demonstrated the efficiency and effectiveness of the Ozone process in producing high quality drinking water . . . pleasant in taste and odorless . . . at reasonable costs.

Do you have a taste, odor or color problem in your water supply system?

Philadelphia's answer through the Welsbach Ozone Process can be your answer, too!

Write today for the Philadelphia story on Ozonation at the world's largest Ozonation plant. The booklet, "Philadelphia Finds the Answer," will be gladly sent you.

THE WELSBACH CORPORATION
OZONE PROCESSES DIVISION

1500 Walnut Street
Philadelphia 2, Pa.

THE CONSTRUCTION WEEK

ICE HARBOR ON ICE?—Determined to keep Congress from putting their pet $86,000,000 Ice Harbor Dam project in the appropriations icebox, Northwest river interests and public and private power advocates are joining forces. Action of the House Appropriations Committee in cutting the project out of the Army's new appropriation request (ENR March 31, p. 23) brought immediate charges from the Inland Empire Waterways Association that opposition by the U. S. Fish and Wild Life Service—not economy alone—was largely responsible for congressional frowns. Proponents contend that the dam (on the Snake River below Lewiston, Idaho) would be finished a year before McNary Dam, and would contribute immediately to relieving a current power shortage.

ALLOCATIONS OUT?—Washington agrees that the bloom is definitely off the steel allocations rose—and with it has gone President Truman's chance of getting any mandatory control legislation. Until a month ago, steel consumers were fighting for supplies, but now half the users who hold priorities (including the Army, Atomic Energy Commission, freight car builders) are willing to take less, and others have shown a tendency to shop around for a price. Effective in June—a two-month lag is allowed to permit delivery to catch up with orders—eight of the 17 users now in the allocation program will be cut as previously announced (ENR March 31, p. 19), and one—for steel houses—will have run out with the user winding up with a surplus.

EVIDENCE OF AID—French power development benefitted to the tune of 36 billion francs ($100 million) from ECA aid during 1948. This is about a quarter of the total aid granted France. About 7 billion francs went into steam plants, the remainder into hydro projects—the works on the Rhone (Genissiat and Mondragon) received 4 billion francs. Continued high investment in hydro power is certain in France, where nearly 50 projects are in various stages of construction.

EASY ON POINT 4—The administration apparently is going to ease into implementation of the President's Point 4—his proposal for an "up by the bootstraps" world development program. Committees now working on the proposal are likely to recommend an additional appropriation of $50,000,000 for the first year. Added to the $30,000,000 already in the 1949-50 budget, this would bring to $80,000,000 the amount available for technical aid. For the present at least, no new agency will be set up—four major groups will handle spending the money: The UN, ECA, Institute of Inter-American Affairs, and the Interdepartmental Committee on Scientific and Cultural Cooperation.

MORE TAXES LIKELY—Speaking of money, the latest pulse-feeling among Congressmen indicates that the legislators will bring out a new tax bill that will up collections by about $2 billion—but they'll probably make it effective next January, rather than July, to give business a chance to decide whether its going to go up, down, or hit something like normalcy. So far, budget-cutting has snipped a bare $250 million off a $41.9 billion budget, and collections are falling behind last year.

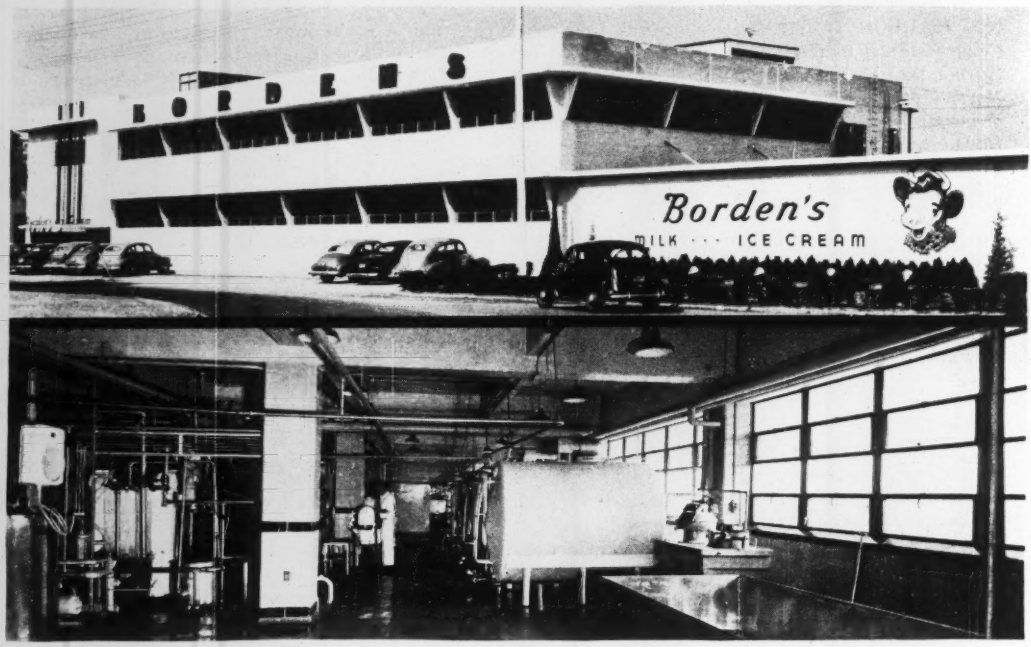
WAIT FOR IT—A month ago, the AGC's highway division took occasion to deplore the slow pay practices of some governmental units for highway work, and hoped for betterment through speedier pay and percentage reduction (of high percentages withheld pending completion of contract). But last week, pressed by a shortage of working capital, the city of Detroit told contractors they will not be paid until work has been completed, and special assessment bonds have been sold. Previously, partial payments were made as work progressed, and the time of payment had no connection with sale of assessment bonds.

WAY OUT—Pennsylvania legislators believe they have found a way out of the dilemma of building new state buildings without a general increase in taxes. Governor Duff signed a new law creating a State Building Authority, with power to issue bonds up to $175 million, that would build state buildings and lease them to the state—using rentals to retire the bonds.

TOO GOOD—A combination of better-than-expected construction progress and a tight budget has left the status of Davis Dam on the lower Colorado River hanging on the speed with which Congress can agree on and put through a deficiency appropriation. The Utah Construction Co. broke all Bureau of Reclamation records by placing 730,000 cu.yd. of fill in 30 days recently—but this progress helped use up all the available money. A deficiency bill was rushed through the House and has already been reported out by the Senate Appropriations Committee, but best estimates on passage of the message are ten days (from April 4).

more free sunlight and fresh air for Elsie

Below: Exterior and interior views of the Borden Co., Plant at Oklahoma City. Truscon Pivoted, Commercial Projected, Architectural Projected and Intermediate Casement Windows, Screens and rack and pinion operators used throughout. The Austin Company, Designers and Contractors.



with Truscon Steel Windows

Borden's milk products are famous for healthful quality and cleanliness!

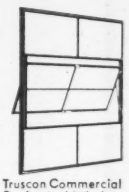
Look at the plants they're produced in . . . like this one at Oklahoma City. And look at the light-giving, easily ventilated windows that aid the well-being of both the milk products and the dairy workers inside the plant!

This Oklahoma plant is completely equipped with Truscon Steel Windows—Truscon Pivoted Windows, Truscon Commercial Projected Windows, Truscon Architectural Projected and Truscon Intermediate Casement Windows . . . also Truscon Screens, and rack and pinion operators!

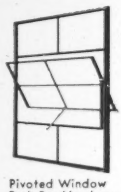
Truscon Steel Windows are permanent and fire-resistant; they never stick, shrink, warp, or fail to operate easily, regardless of climatic conditions; they provide adequate and proper ventilation; and their slender but strong muntin bars admit the maximum of light to the interior.

Truscon Steel Windows are adaptable to all types of industrial and commercial buildings, including warehouse, factory and storage buildings, garages, filling stations, and a host of other installations.

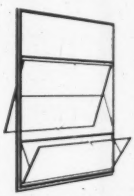
The architectural correctness, substantial hardware, ease of installation, economy and low upkeep of Truscon Steel Windows will be of help to you in your planning. May we send you a complete new catalog of Truscon Steel Windows?



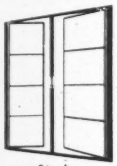
Truscon Commercial Projected Window



Pivoted Window Push Bar Hardware



Truscon Architectural Projected Window



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New Literature.

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Those Needed Schools

THREE independent surveys—one by this journal, one by the Bureau of Community Facilities, and one by the NEW YORK TIMES—are in good agreement that the U. S. needs something like $10 billion worth of new schools. It seems pointless to belabor this fact with new statistics—as pointless as further checks on the need for more and better highways or sewage systems. Not quite so pointless is an attack on school building costs. Fundamentally, any such sum as $10 billion can be supplied only through a major change in our taxing system, whereby more funds can be made available to the school boards. In the meantime, however, if the cost of school building could be reduced, some communities would go ahead. The New York State Education Department has started in the right direction with a campaign favoring the elimination of deluxe items and the general simplification of school designs. In New York City, a contractors' committee has been established to assist the Board of Education in its building plans. Architects in some instances have instituted a special type of service whereby they will survey school needs and give advice on locations and required size and type of buildings to aid school boards in their preliminary planning. Many similar measures directed toward cutting school building costs, are going to be required if those needed schools are going to be built.

Panel Construction Can Cost Less

ACCEPTANCE of panel construction for buildings seems to be growing by leaps and bounds. One application—to wall construction—is described on p. 73 of this issue, for a case where insulated cellular panels were used with a stainless steel facing and carbon steel backing. There are many other examples, involving different facings, backings and insulation. Shop-fabricated for efficient production and quality control, these "sandwiches" are designed for speedy erection, with workmanship and uniformity too costly to obtain with conventional wall types assembled in the field.

Similar construction is also used for floors and roofs. But the purpose is generally the same: to save time and money by using thin, light-weight, large-size panels having adequate structural, architectural and thermal properties.

There are also many indirect benefits. Job cutting and waste are kept to a minimum. Masonry debris, mortar spillings and clean-up work normal to ordinary floor and wall construction are completely eliminated. Floors can be installed as fast as the framework goes up, and a working platform is available for all trades from the moment the panels are placed.

However, panel construction could be even less expensive. As one manufacturer points out, if the product could be standardized on a certain limited number of sizes, the price per unit could be reduced at least 25 percent. Architects and engineers could help bring prices down for panel construction by asking the manufacturers to standardize and by using only standard sizes.

The Engineer Decides!

THE RECENT DECISION of the Cook County Superior Court casting aside an injunction brought by a taxpayer's suit and permitting use of porous-plate diffusers designed by experts of the Sanitary District of Chicago will hearten consultants as well as municipal officials. Too often responsible engineers are harassed by court actions attempting to force adoption of equipment or processes sincerely believed neither to afford the best solution to a particular problem nor be in the best interest of the municipality. The Chicago decision strengthens the basic right of qualified engineers to make technical decisions based on their investigations, experience and judgment. It also underlines the professional impropriety of attempting to compel acceptance of unwanted, undesirable or questionably applicable products.

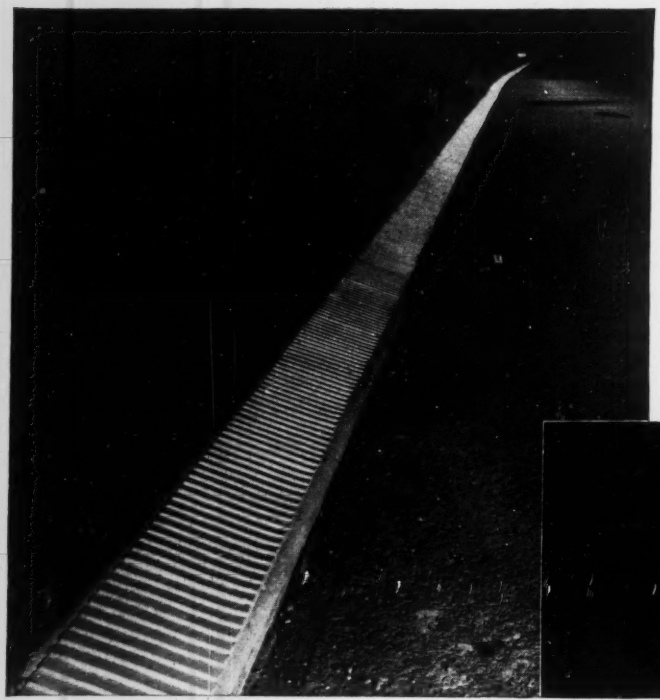
Gifts of Land for Highways

THIRTY-ONE PROPERTY OWNERS in Middlesex County, New Jersey, have deeded to the state for the nominal fee of $1 the land needed to widen state highway No. 25 from a two-lane to a four-lane divided highway. That is a very practical way to express public spirit.

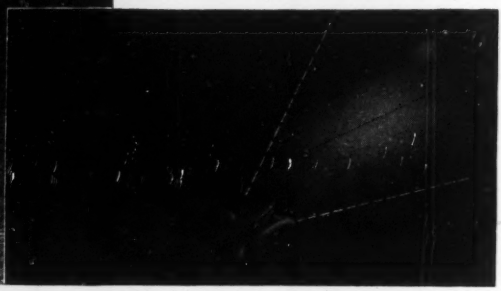
In making public a list of the people who took this unusual action, State Highway Commissioner Spencer Miller Jr. said: "Those who are extending such willing aid so generously are contributing to an improvement that will remove one of the most dangerous sections of major highways in the United States. Their action is in contrast to the excessive demands made at times by property owners where a public improvement is made."

Doubtless there are many citizens in other states who would take similar action if such a plan were put up to them as an opportunity for public service that will be properly recognized. But movements of this kind need a bit of diplomacy to get them started and then some showmanship to dramatize the action. Good newspaper publicity helps. Signs along the widened highway saying that the adjoining landholder gave the land for the widening would also be useful. The work involved should pay dividends in better public relations for the state highway department as well as in the savings for the taxpayer.

NIGHT DRIVING MADE SAFER!



with ATLAS WHITE REFLECTING CURB



A smooth curb wastes the car's headlights. It reflects light away from the driver. Edge of road is difficult to see. Driving dangers are increased.

Difficulty in defining the road ahead is one of the main hazards of night driving. This danger is minimized on a highway edged with White Reflecting Curb made with Atlas White Cement. The saw-tooth faces of reflecting curb catch the headlight rays and reflect them *back to the driver*. This makes the curb . . . the road's edge . . . highly visible. And because water makes the curb even more mirror-like, visibility is even better on rainy nights.

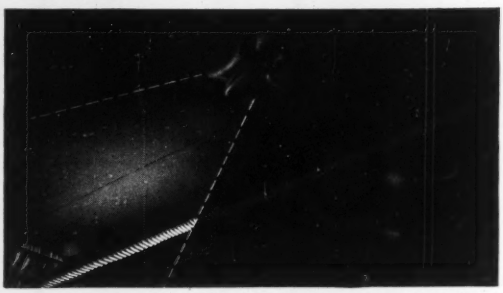
Day or night . . . dry or wet, traffic flows smoothly and safely on roads with White Concrete Reflecting Curb. Send for further information. Write to Atlas White Bureau, Universal Atlas Cement Co., (United States Steel Corp. Subsidiary), Chrysler Bldg., New York 17, N. Y.

AT NO EXTRA COST

All the advantages of air-entraining portland cement—resistance to effects of freezing-thawing weather and scaling action of de-icing salts, easy placement, greater durability — now available. Ask about

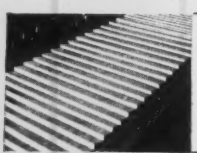
ATLAS WHITE *DURAPLASTIC

**Duraplastic is the registered trade mark of the air-entraining portland cement manufactured by Universal Atlas Cement Co.*



White Concrete Reflecting Curb utilizes the car's headlights. Saw-tooth faces mirror the light back to driver, form a continuous, bright ribbon of light at the road's edge. Driving is safer.

ENR-RM-56



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ENGINEERING NEWS-RECORD

APRIL 14, 1949 VOL. 142 NO. 15

Senate reorganization bill offers Army no exemption

Single vote keeps Army civil works from special treatment in Senate reorganization bill — Administration seen ignoring Hoover Commission's proposal to cut out FWA

A one-vote margin in Senate committee prevented the civil functions of the Corps of Engineers from getting special exemption in the Government Reorganization Bill reported to the upper house last week.

As submitted to the Senate by its Committee on Expenditures in the Executive Departments, the bill (S. 526) contains no exemptions and no requirements for "one package" treatment of departments or agencies.

The measure does have one catch—veto power by either house of Congress—calculated to snag any presidential reorganization plan that fails to win the support of both the Senate and the House. Chairman McClellan of the Senate Expenditures Committee feels sure this provision is enough to stop any proposal for transferring Army civil functions to the Interior Department—as recommended by the Hoover Commission (ENR March 24, p. 9)—or to any other agency.

Even so, the chairman took no chances. He offered an amendment in committee to exempt Army civil works, and his proposal lost by a bare five to four vote. Other restrictive amendments that would have the effect of excluding certain agencies—such as the national military establishment—from any general reshuffling of the executive branch were likewise rejected by the committee.

Senate bill exempts military

In this respect, the Senate bill appears to be an improvement over H. R. 2361 as passed by the House (ENR Feb. 17, p. 45). The House measure stipulated that the President could not include the Department of National Defense—or six other named agencies—in any general reorganization plan. A separate proposal would be required for each of these units. The Senate committee refused to include any such restriction in its bill.

Another less serious limitation was added by the Senate committee: To permit review of the authority granted by Congress, the bill allows the President to submit reorganization plans only until April 1, 1953. The House measure contains no time limitation.

Eight weeks may pass before the Senate can act on the committee's bill. After the Senate has passed its bill—undoubtedly with some amendments—the House and Senate measures will go to a Joint Conference Committee for reconciling differences.

Another House bill restriction was eliminated by the Senate group. The committee refused to prohibit the creation of new departments—headed by secretaries with cabinet rank—in reorganization plans submitted by the President.

Meanwhile there were other indications that the Administration was not planning to go along with all recommendations of the Hoover Commission. In its reports to Congress, the commission had proposed dismemberment of the Federal Works Agency, transferring public roads to Commerce and public buildings and community facilities to Interior.

Last week, Administration support was reported for a bill that would assign the procurement and disposal of government property to FWA. The plan involves transfer to FWA of the Bureau of Federal Supply and the War Assets Administration.

A bill to that effect is now before the House committee on expenditures. Hearings are being held by a subcommittee. The measure is substantially the same as one introduced in the last Congress and reported favorably by the Senate expenditures committee, but never voted on by either chamber.

As another boost for FWA, the Senate has passed a bill (S. 714) authorizing $40,000,000 for site acquisition and planning for federal buildings—postoffices, courthouses and the like. The House public works committee has favorably reported a similar measure (H. R. 3662).

Purpose of these bills is to have sites and plans ready for public building construction when needed. The measures include $30,000,000 also for repair and modernization of existing buildings. Activities would be directed by the Public Buildings Administration.

House committee OK's $65 million UN loan

Funds for a $65,000,000 loan to the United Nations are recommended in the second deficiency bill for fiscal 1949, favorably reported last week by the House Appropriations Committee. The loan—to finance construction of the UN headquarters building in New York—was authorized by Public Law 903, signed Aug. 11, 1948.

In the same deficiency bill is a recommended appropriation of $110 million to the Atomic Energy Commission for construction. The amount is needed to liquidate contract authority granted AEC in the Independent Offices Appropriation Act, 1948.

Total contract authorization given AEC at that time amounted to $400 million. Appropriations totaling $250 million have been made toward covering this authority. AEC has incurred contract obligations of $396 million.

N. C. State to offer B. S. in construction

North Carolina State College school of engineering at Raleigh next September will offer to qualified students a curriculum which will lead to the degree of Bachelor of Science in Construction.

"Students receiving this degree will fulfill the great need in North Carolina for men trained with a background of engineering, but yet not requiring the intensive engineering education given to those who are currently enrolled in the school of engineering," said Dean J. H. Lampe in announcing the course.

Prof. C. R. Bramer, acting head of the college's civil engineering department, claims the curriculum is "set up as a program of study that will integrate engineering, administration, job management, labor relations, and construction methods and practice."

NEWS BRIEFS

Dams — Allis-Chalmers Mfg. Co., Milwaukee, was apparent low bidder at $2,500,600 for furnishing four turbines for the power plant at FORT RANDALL DAM, S. D. . . . Invitations have been issued by Yellowstone district, Bureau of Reclamation, for bids on investigational work at the site of Yellowtail Dam on the Big Horn River, about 35 miles southwest of HARDIN, MONT.

Hospitals—Ground for a $7,000,000 children's medical center was recently broken in BOSTON, MASS., near the Children's Hospital. . . Construction may start this summer on the $1,250,000 Greenwood-LeFlore Hospital at JACKSON, MISS. . . Gov. W. Preston Lane of MARYLAND has proposed a complete reorganization and reconstruction of the state mental hospital system and has asked the General Assembly for $19,994,800 to begin the job. . . Two new hospitals are being built in TORONTO, ONT., at a total cost of $11,250,000. The Toronto Hospital for Sick Children has steel work complete, and stone work has started. This hospital will have 600 beds. It will cost $7,000,000. The second is the new 250-bed Mount Sinai Hospital, being built at cost of $4,250,000.

Housing—AS 10,000,000 apartment project is planned for COLLINGWOOD, N. J., a suburb of CAMDEN, N. J., and PHILADELPHIA, PA., by Sylvester A. Lowery, Philadelphia . . . An 18-story reinforced concrete apartment building of 370 units to cost more than $3,500,000 will be built in SEATTLE, WASH. The owner is the Keller-Block Corp. and contract has been awarded to Walter W. Harfst Co., Inc., and Wm. L. & Harry Henson . . . Martin Nadelman has launched a second housing development of $2,000,000 in HOUSTON, TEX. . . . In INDIANAPOLIS, IND., a $3,800,000 home building project developed by Schloss Bros. is expected to be completed next year, according to Lowell Frazer, construction manager . . . Construction has begun on the first 680 of 4,600 units in a $110 million community project in DALY CITY, CALIF., just south of SAN FRANCISCO . . . Groundbreaking has started for the $5,000,000 Monroe Park Homes on the Kennett Pike, WILMINGTON, DEL. . . . The trustees of DENVER, COLO., University have approved a $2,000,000 student housing project . . . BOSTON, MASS., Housing Authority will start two veterans' housing projects in the BRIGHTON section in June at a cost of $12,958,000, to provide for 906 families and will be financed under the state housing program . . . Work has been started on a community dwelling project in VILLE ST. LAURENT, near MONTREAL, QUE., to cost about $10,000,000 . . . Park Drive Manor is getting bids on a $5,000,000 apartment project at PHILADELPHIA, PA.

Airports—SAN FRANCISCO will vote next November on a $10,000,000 airport bond issue, needed to complete an improvement program already under way. . . Gov. Paul A. Dever recently asked the MASSACHUSETTS legislature for $3,000,000 to avert a delay in completing the apron building at Logan International Airport in EAST BOSTON. . . It is reported that a $70,000,000 reconstruction and improvement program during the next 15 years is planned for MACDILL FIELD, FLA.

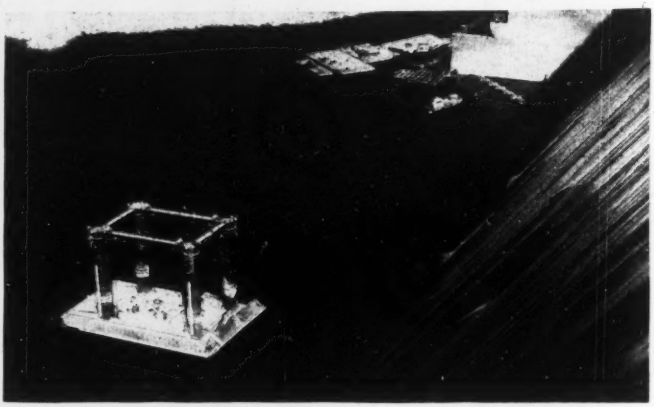
Labor — Citing a decrease in the government cost of living index, the ELMIRA, N. Y., Area Builders Exchange has refused to offer union building trades craftsmen any wage increase over the 1948 rates. . . Construction trade truck drivers and plasterers' hodcarriers in AKRON, OHIO, got a 10-cent hourly boost on March 31. . . AFL union bricklayers in CANTON and STARK COUNTY, OHIO are now getting 12½ cents an hour more pay, increasing their hourly rate to $2.50.

Pollution prevention law is now pending in Ohio

A law prohibiting the discharge into public waters of untreated sewage or industrial wastes, which for the first time gives the Ohio state department of health the power to initiate preventive action before a gross nuisance is proved, was given unusual support at a legislative hearing last week. Spokesmen for the Ohio Association of Manufacturers and for municipalities —upon whom would fall the burden of building remedial works—expressed their satisfaction in favor of the bill along with conservation and medical group representatives.

The measure, known as S-60, will permit Ohio to take an aggressive stand on stream-pollution abatement. Under existing laws the health authorities can take action only after polluting material has "so corrupted a stream . . . as to give rise to foul and noxious odors or to conditions detrimental to health or comfort." This situation, states Fred Waring, state sanitary engineer, means that a stream must be practically ruined before a case can now be made against a polluter.

Testifying in support of the bill, Edward J. Cleary, formerly executive editor of ENGINEERING NEWS-RECORD and now chief engineer of the Ohio River Valley Water Sanitation Commission, pointed out that the passage of this bill would enable Ohio to satisfy its obligations under the terms of the compact through which eight states in the Ohio Valley are pledged to curb stream pollution.



FLOATING CAISSON LAUNCHED—Repair of eroded spots on the spillway of Grand Coulee Dam will be accomplished by use of this floating caisson, shaped to fit contours of the spillway bucket. Access to the working chamber from the barge above will be through the four cylinders, which are 60 ft. long and will extend 22 ft. above the surface when the 1,500-ton caisson is lowered next fall.

Hospital not fireproof; flames kill 75

Officials of the Illinois State Fire Marshal's office and other state and private agencies were investigating last week into the causes of a fire at the St. Anthony Hospital, Effingham, that caused at least 75 deaths.

The 80-year-old building suddenly went up in flames near midnight, April 4, and burned so rapidly that firemen were unable to save much of the structure, and many patients and members of the hospital staff were trapped by flames and smoke.

According to data on file in the fire marshal's office at Springfield, the hospital was a two and one-half story structure, with brick exterior walls and wood joist and frame construction. The roof was sheathed in wood and covered with composition roofing.

The original building had been added to from time to time. Some extensions were non-combustible construction, but these communicated directly with older sections.

The hospital had no sprinkler system. There was only one system of standpipe and hose, with one riser. All elevator shafts, stairways and clothes chutes were open, and the building had only two slide-type fire escapes and one conventional fire escape. None of these were usable, however, since fire completely blocked the corridors leading to them.

Fire insurance rates were 62 cents per hundred dollars on the building—a rate which insurance men agreed would indicate little or no fire resistance value in the construction and equipment.

According to a preliminary report by James K. McElroy, assistant technical secretary of the National Fire Protection Association, rapid spread of the fire through the corridors of the upper floors was facilitated by a combustible acoustic tile on the ceiling and upper part of the walls. Similar materials have been shown by test to have a flame-spread classification of 225, compared with a classification of 100 for oak or fir, he said.

Mr. McElroy also attributed the quick spread of the fire to lack of an automatic fire-detection system.

No official report on causes of the blaze was available last week, pending completion of detailed investigations. However, newspaper and eye-witness reports indicated that the fire started in the basement—possibly among some cans of paint and varnish stored there—and spread rapidly through the wooden structure by way of the open clothes chutes and shafts and stair wells.

N. C. power company plans 4 hydroelectric projects

The Nantahala Power and Light Co., of Franklin, N. C., has filed with the Federal Power Commission declarations of intention to construct four hydroelectric projects—with a total capacity of 22,000 kva.—on the east fork of the Tuckasegee River, a tributary of the Little Tennessee River, in Jackson County, N. C.

The projects, designated Wolf Creek, Island Ford, Bear Creek and Cedar Cliff, would utilize the water runoff from the tributary drainage area.

Nantahala Power said that none of the four projects would have any probable effect on present or prospective navigation.

USBR considers building 30-mile tunnel in Idaho

The 100-year-old Department of the Interior may start off its next "Century of Conservation" with construction in southwestern Idaho of a 30-mile tunnel. R. J. Newell, regional director for the Bureau of Reclamation at Boise described the plan.

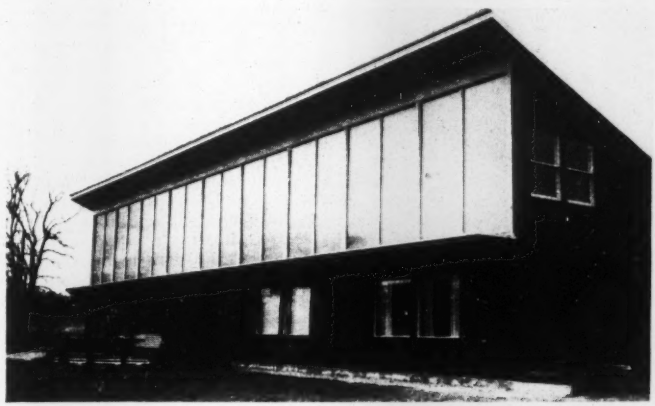
The tunnel, 19 ft. in diameter, is being considered as part of the 192,000-acre Payette unit of the Mountain Home irrigation project near Boise. Designed to carry surplus Payette River water into the Boise Valley to permit release of Boise River water into the Mountain Home area, the huge bore would pass through several mountain ridges. At one point it would be 2,400 ft. below the surface.

Chief engineer Leslie N. McClellan and staff of the bureau's Denver office have decided that the tunnel is feasible from an engineering standpoint. It would replace a 51-mile long aqueduct over another route, outlined in original plans. Mr. Newell pointed out that before construction can be initiated, the Mountain Home project must be found economically feasible. Congress must authorize the construction and provide appropriations.

If undertaken, the tunnel would be driven through a mountainous area between the upstream end of Garden Valley, near Banks, Idaho, to Moores Creek in the Boise River Basin, passing under the Placerville-Quartzburg area, a famous gold mining region. It would have a fall of 137 ft., or 4¼ ft. to the mile, and a maximum capacity of 2,700 cfs. Horseshoe-shaped, it would be lined with concrete about 18 in. thick. The water would have a velocity of about 10 ft. per second—under free flow conditions—but the engineers are considering a plan for making it a pressure tunnel.

An estimated 6 to 8 years would be required to complete the structure, with 1,000 to 1,500 men employed.

The alternate aqueduct would consist of 26 miles of open canal and six tunnels, totaling 24 miles in length.



SOLAR HOUSE HAD EASY WINTER—Maria Telkes, associate researcher at Massachusetts Institute of Technology, admits that this open winter in Dover, Mass., was no test for her $20,000 solar heated house (ENR Sept. 23, p. 7). Still she claims the $3,000, salt-melting, warm-air-heating unit under her roof will warm the house through 10 sunless days. Warm air goes through ducts to "heat bins" in the five rooms. There is an 800-sq. ft. black metal sheet under the glass roof. Another solar house at MIT uses a hot-water system (ENR Mar. 10, p. 13). (Wide World Photo)

President signs Upper Colorado pact

President Truman last week signed the congressional act confirming the five-state Upper Colorado River basin compact. Approval of the law opens the way for the federal government to proceed with long-awaited overall development of the basin's resources.

Utah, Colorado, Wyoming, New Mexico, and Arizona already had signed and ratified the compact (ENR Aug. 5, 1948, p. 57). Now in full force and effect, it apportions the use of water by each of the upper basin states under the basic Colorado River Basin Compact of 1922.

"Projects in the upper basin can now be put forward for congressional authorization and construction," Interior Secretary Krug explained. "The Bureau of Reclamation has already been consulting the states on upper basin development. A plan—highly tentative to date—has been informally discussed with them as a step toward formal action. The tentative plan embraces construction of the primary upper basin storage reservoirs and a small initial group of irrigation developments in Utah, Colorado, Wyoming, and New Mexico. In its final form, still more developments undoubtedly will be embraced in the upper basin program."

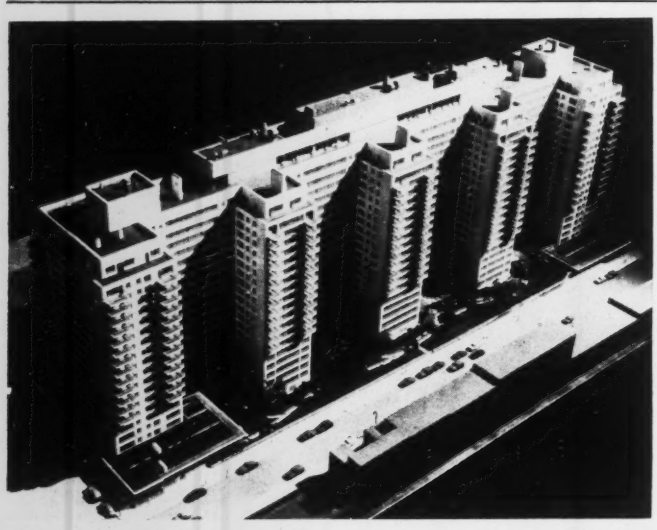
"The need for expediting further irrigation, hydroelectric and other development in this five-state region is urgent and compelling. In no areas are the basic demands for water and power being satisfied."

Commissioner of Reclamation Michael W. Straus pointed out that the two compacts and the previous Interior Department report on Colorado Basin-wide development have laid a firm groundwork for effective action in getting the upper basin program underway.

"The initial group of irrigation projects would develop approximately 100,000 acres of new irrigated farm lands and provide supplemental water for more than 200,000 acres now inadequately supplied" Mr. Straus said. The main dams would furnish more than 1,780,000 kw. of installed hydroelectric capacity, with other benefits such as flood control, recreation, fish and wildlife, and municipal water."

Projects suggested in the initial plan discussed with the states are the central Utah and Gooseberry projects in Utah; the Collbran, Florida, and Paonia projects and Minnesota unit in Colorado; the Eden, Lyman, and Seedskadee projects in Wyoming; the Hammond project in New Mexico; the La Plata units and the Pine River project in Colorado and New Mexico. The Bureau of Reclamation is investigating other projects which could be brought under development as studies are completed.

Main storage reservoirs contemplated for river regulation call for such dams as the Red Canyon, Rattlesnake and Split Mountain dams in Utah; Echo Park, Cross Mountain and Cottonwood dams in Colorado, and Glen Canyon Dam in Arizona.



MANHATTAN HOUSE, a deluxe 19-story, reinforced concrete apartment building, will be constructed for New York Life Insurance Co. by Cauldwell-Wingate Co., New York, under a lump sum contract exceeding $10,000,000. Ground was broken last week, and completion of the 582-unit structure is expected by fall 1950. Glazed, self-washing brick and extensive use of glass should make the structure stand out in Manhattan's upper east side. Outdoor-indoor synthesis is sought throughout by the architects—Mayer and Whittlesey associated with Skidmore, Owings & Merrill—who have set the building back so that 65th and 66th streets can be widened from 60 to 100 ft. Charles Mayer of New York is the consultant engineer.

No cause for concern seen in reclamation fund cut

A break-down of the Interior Department's House-approved appropriation, reported last week (ENR, April 7, p. 11), shows all reclamation requests well satisfied. While cut $80,000,000 below budget estimates, the Interior fund still sets up $296 million for Bureau of Reclamation projects.

Construction money in the bill exceeds the fiscal 1949 funds by nearly $70,000,000. Bureau officials are not deeply concerned about the 15 percent cut in construction appropriations. They feel that some saving may be made in fiscal 1950 expenditures—as compared with estimates prepared last fall. If additional funds should prove necessary, they believe Congress will be receptive to supplemental requests that can be justified—as indicated by the House committee in its report on the measure.

The bill would revive the Southwestern Power Administration with funds for a three-year $31,000,000 program of transmission line construction. Funds actually allotted in the bill for this purpose comprise a $4,000,000 cash appropriation and $5,000,000 in contract authority. The House committee's report approved the entire SPA construction program for distributing power from Army Engineer dams in the Southwest.

Bonneville power received appropriations totaling $29,927,500 and contract authority for $15,725,000. The committee report approved all of Bonneville's proposed construction.

Other construction funds earmarked by the Interior bill as it passed the House include: Bureau of Indian Affairs, $7,800,000; National Park Service, $17,600,000; Government in the territories, $25,700,000 for Alaskan roads, plus $7,000,000 in contract authority.

Wyoming reclamation plan dropped as uneconomic

Construction of the proposed Lyman reclamation project—to furnish supplemental water for 40,600 acres in Uinta County, Wyo.—was recommended for deferment recently by Secretary of the Interior J. A. Krug. Lack of ability to repay the entire construction cost in the time required by law was the reason for disapproval of the project.

The secretary held the door open for later authorization and construction—possibly when the power revenue from large storage reservoirs in the upper basin may be available to help share the cost burden. Another possibility would be through modification of existing repayment law.

Commissioner of Reclamation Michael W. Straus pointed out that the whole cost of the project is properly allocable exclusively to irrigation. He estimated that the project would take more than 150 years to pay out.

Project plans call for construction of an earth-fill dam 185 ft. high to impound 43,000 acre-feet of water at the bridge site on Willow Creek, together with a distribution system. Estimated cost is $9,235,000.

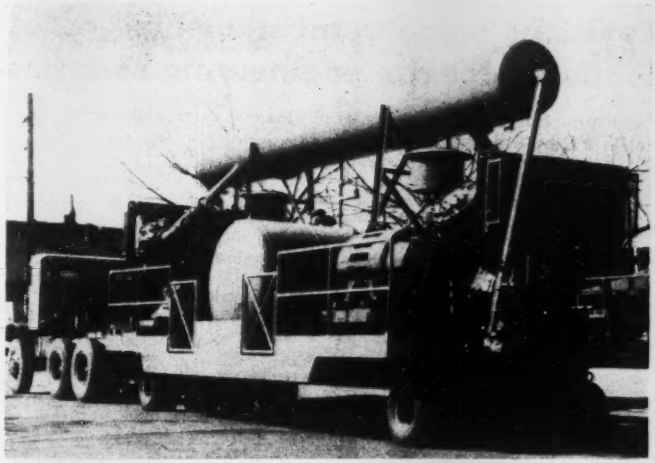
Oregon Legislature OK's Rogue River reservoirs

Green light to the Bureau of Reclamation's plans for a $90,000,000 irrigation, flood control and power project in the Rogue River basin in southwestern Oregon was given by the Oregon Legislature when it passed a bill which would permit construction of a dam on the Rogue at Lewis Creek.

Specifically, the measure changes the line below which no dams may be constructed on the Rogue. It moves the line downstream 8 miles. Sports groups opposed the proposal, but proponents of the measure insisted it would not harm fish life.

Plans for the completed project involve nine storage reservoirs with an aggregate capacity of 517,900 acre-ft. Seven of the dams would be on tributaries of the Rogue and two on the Rouge itself.

The lower of the two reservoirs on the Rogue would serve irrigation, power and flood control purposes. The lower reservoir on the Rogue, created by the Lewis Creek dam, would have a storage capacity of 350,000 acre-ft. A mile below the Lewis Creek site, a 40-ft. dam would divert water into canals leading downstream on both sides of the river.



MASSIVE MOBILE COMPRESSOR can follow the jumbo right down to the tunnel face and supply 110 psi. air pressure to its drills. Mounted on a 30 ft. long, 16-tire trailer, the unit consists of two electrically driven compressors that total 1,500 cfm. Winter-Weiss Co., Denver, designed and built this plant, collaborating with the U. S. Bureau of Mines.

Imperial irrigation group to vote on power project

Voters of the Imperial Irrigation District will decide on a $12,500,000 issue of power revenue bonds at an election to be held in a few weeks, it has been announced by Evan T. Hughes, district president, El Centro, Calif.

Providing clearance is obtained from the federal government, the principal project will be a 33,000-kw. hydroelectric plant at the Pilot Knob site on the All-American Canal. Otherwise, the plan is to add a 30,000-kw. steam station to the present one nearing completion at El Centro, and to build a 9,600-kw. hydroelectric plant at the Drop 2 site on the All-American Canal. Other additions and improvements to the system also would be financed by the proposed bond issue.

Preliminary plans for the proposed hydroelectric plant at Pilot Knob were prepared in 1945 by district engineers and the Bureau of Reclamation. Plans for the other work have not been prepared, and an engineering firm will not be retained until the bond issue is finally approved. Then plans and specifications will be submitted in its entirety. Feasibility of the project has been approved by California District Securities Commission. Gibbs and Hill, consulting engineers, of New York City, prepared the plans on the El Centro steam plant now being completed.

FPC OK's $100 million lines to bring Texas gas to Pa.

The Federal Power Commission has authorized the Texas Gas Transmission Corp. and the Texas Eastern Transmission Corp. to build 1,175 miles of pipeline facilities costing nearly $100 million. The new lines will carry natural gas from the east Texas, Texas Gulf coast, and north Louisiana areas to Kentucky, Tennessee, Indiana, Ohio and Pennsylvania.

Facilities authorized for construction by Texas Gas include 723 miles of 26-in. line from the Lisbon gas field in Louisiana to a point near Middletown, Ohio; 110 miles of 20-in. line from the Carthage field in east Texas to the Lisbon field; a 32-mile lateral in Indiana from Madisonville to Evansville; and 10 compressor stations with an initial installed capacity of 68,000 hp. Total estimated cost is $73,500,000.

Construction proposed by Texas Eastern and authorized by the commission includes 177 miles of 26-in. line extending eastward from a point of connection with the Texas gas facilities near Middletown, Ohio; a 100-mile extension of the Little Big Inch Line in Texas; 33 miles of loop line near Beaumont, Tex.; 36 miles of loop line between Castor and Lisbon; and additional compressor facilities. Total cost of these facilities has been estimated at $24,052,000.

Revisions made in membership grades proposed for the engineering societies

Engineers' Council for Professional Development expects to have uniform standards ready for action this year

The study of uniform grades for membership in the principal engineering societies begun last year by the Engineers' Council for Professional Development has reached a point where it is now expected that minimum qualifications for the proposed grade will be ready for approval of the council at its annual meeting in October.

Tentative specifications for three "essential grades" of Member, Associate Member (formerly Junior Member), and Student Member were submitted to the council last October (ENR Nov. 11, p. 73), also specifications for optional grades of Fellow and Affiliate. These had been drafted by the ECPD Committee on Professional Recognition, of which Ole Singstad is chairman. Following a discussion by the council, it was decided to call a conference of official representatives of the principal engineering societies to determine whether these specifications could be put in a form that would have a good chance of acceptance by most or all of the societies.

That conference was held in New York on Feb. 25 under the chairmanship of James W. Parker, chairman of ECPD. Representatives from eight societies participated. The American Society of Civil Engineers was represented by William N. Carey, executive secretary; Dean G. Edwards, chairman of the ASCE Committee on Membership Grades, and V. T. Boughton, vice-chairman of the committee and ASCE representative on the ECPD executive committee. The National Society of Professional Engineers was represented by D. B. Steinman and Russell G. Warner; Harry S. Rogers and D. B. Prentice represented the American Society for Engineering Education.

Minimum requirements proposed

Discussion indicated that if the specifications set up by the Singstad committee could be considered as minimum requirements, the probability of their acceptance by the five principal engineering societies that have more than one grade of membership is good. Also, it was stated that requirements for the member grade would have to be broad enough to admit men without engineering training but who have equivalent training in related fields because the American Institute of Mining Engineers admits geologists to full member grade, and the ASCE admits both geologists and architects.

Numerous changes in the qualifications for the several grades of membership were approved by the conference and referred to Mr. Singstad's committee, which on March 22 submitted a revised set of requirements to the ECPD executive committee. They are as follows:

A **Member**, at the time of his admission or advancement to that grade, shall be a graduate of an engineering curriculum approved by the governing board of the society concerned and shall in addition have had not less than four years of increasingly important engineering experience indicative of growth in engineering competency and achievement and of a character satisfactory to that board at least two years of which shall have been in responsible charge of engineering work. If not such a graduate, he shall have had not less than ten years of engineering experience satisfactory to the governing board of the society concerned.

An **Associate Member** shall, at the time of his admission or advancement to that grade, be a graduate from an engineering curriculum approved by the governing board of the society concerned. If not such a graduate, he shall have equivalent attainments, including at least six years of engineering experience of a character satisfactory to the governing board.

A **Student Member** shall be registered in an undergraduate or a graduate engineering curriculum approved by the governing board of the engineering society concerned and shall be pursuing a course of study in preparation for the engineering profession.

Interpretation of qualifications

In considering the qualifications for the grades of Member and Associate Member, the following additional interpretations apply:

(a) A license to practice professional engineering issued by a legally authorized body, or the passing of an examination prescribed by the governing board of the engineering society concerned, may be accepted as qualifying experience for the grade of Member.

(b) Engineering teaching of a character approved by the governing board in a curriculum approved by that board, shall be considered to be qualifying experience.

(c) If not a graduate of an engineering curriculum, approved by the governing board of the society concerned, a graduate of a natural or physical science curriculum related to engineering and of equivalent standing, generally qualifies for the grade of **Affiliate**. The governing board of a society, however, may at its discretion, give such graduates in natural or physical sciences consideration as Member or Associate Member.

The grade of **Fellow** shall have an

John L. Savage wins the Washington Award

John Lucian Savage, internationally known civil engineer, has been designated 1949 winner of the Washington Award, made annually by a joint committee of the American Society of Civil Engineers, American Society of Mechanical Engineers, American Institute of Electrical Engineers, American Society of Mining and Metallurgical Engineers, and the Western Society of Engineers.

Savage will receive the award "for his unselfish public service devoted to the creation of monumental hydraulic structures utilizing natural resources." The award will be made at a dinner in Chicago on April 20, at which time he will discuss the Yangtze River Dam project underway in China.

Mr. Savage has been with the Bureau of Reclamation since 1903 (except for an eight-year leave) in various engineering capacities. No longer chief designing engineer, he is still a USBR consultant.

honorary status to which an engineer of distinction is called, but for which he cannot apply.

The grade of **Affiliate** shall apply to those who are not professional engineers but whose pursuits, scientific attainments, or practical experience qualify them to cooperate with engineers in the advancement of engineering knowledge and practice.

Second conference called

The executive committee of ECPD, after reviewing the revised qualifications, voted to call a second conference late in May, at which time it is expected that the revised recommendations of the Singstad committee can be put in final form for approval by ECPD. If approved, they will then be recommended to the several societies for adoption.

Serious need of sewerage seen for Los Angeles

The 245-mgd. high-rate activated sludge sewage treatment plant now under construction by Los Angeles at Hyperion will be inadequate by 1953—soon after initial operation—according to Merrill Butler, deputy city engineer (ENR May 29, 1947, vol. p. 874). By that time the design population of 3,000,000 will be passed, Mr. Butler told a meeting of the California sections of the American Society of Civil Engineers held in San Diego recently.

Discussions by C. C. Kennedy, San Francisco consulting engineer, and A. L. Genter, Baltimore consulting engineer, centered on the fertilizer production of the plant. The Hyperion plant will, it was claimed, have the biggest digestion system in the world with a production of 200 tons of digested solids per day. Using a conservative estimate of $10 a ton, it is expected that revenue from the sale of fertilizer will reach three-quarters of a million dollars annually.

Some 400 attended the San Diego sessions. Success of this second California convention will help set a pattern for future regional ASCE meetings. The society is considering reduction of the number of national meetings held each year from the present four to only one or two.

A convention highlight was the student paper contest with representatives of nine colleges and universities participating. First prize was won by John Healt, California Institute of Technology, with a paper on "Water Supply in the Santa Barbara Area." John D. Marchand, Stanford University, was runner-up.

Three meetings planned "south of the border"

Summer engineer meetings include ASCE, another in Mexico, and one in Rio

By coincidence three special conventions are scheduled this summer in which engineers from both North and South America can participate. Two will be held in Mexico City and one in Rio de Janeiro, Brazil.

The first meeting, April 30 to May 7, in Mexico City is to be known as the First International Civil Engineering Congress. It has been organized by the Society of Professional Civil Engineers of Mexico under sponsorship of the Mexican government, the National University of Mexico, the National Polytechnic Institute and the Association of Engineers and Architects of Mexico. These groups have had such a meeting under study since just after the war with the object of exchanging information with delegates from other countries. The agenda will cover all phases of civil engineering interest. Francisco Gomez-Perez, consulting engineer of Mexico City has attended numerous engineering conventions in the United States during the past two months and publicly extended invitations to all members to attend the International Congress. Further information can be obtained from him at his address, Alpes 350, Lomas, Mexico, D. F., Mexico.

The other two meetings will occur simultaneously—the First Pan American Engineering Congress in Rio de Janeiro, July 15-24, and the summer meeting of the American Society of Civil Engineers in Mexico City, July 13-16. The ASCE meeting, although held in a foreign locale, will be the normal summer convention that otherwise would have taken place in some U. S. city in the Southwest or West. In this connection, it has been pointed out that Chicago is closer to Mexico City than it is to our own West Coast.

ASCE members in Mexico City will handle the local arrangements just as the members in any U. S. city would. The program will cover both U. S. and Mexican projects and developments, and is looked upon as providing a rare opportunity for closer cooperation between U. S. and Mexican engineers.

The First Pan American Engineering Congress in Rio is being promoted by the South American Union of Engineering Associations. Organized according to the extensive pattern set by other international conferences, particularly in Europe, it will have nine main committees each devoted to a branch of engineering such as transport, construction, electric power, sanitation, etc., with each committee charged with developing a program. Papers have been invited from U. S. engineers, and the closing date for receiving them is April 30. The Engineers' Joint Council has set up a "committee on U. S. participation" under the chairmanship of S. S. Steinberg, dean of engineering, University of Maryland, College Park, Md., and further details are available from him.

HIGH FLYING HIGHWAY ENGINEERS—This recently purchased four-seater plane of the New Mexico State Highway Dept. has already proved its worth for fast travel, route reconnaissance and emergency work. Used extensively by the department, the plane cuts down the great travel distances throughout the state. Shown here are H. R. Payne, acting chief clerk; B. G. Dwyre, department engineer; and J. R. Mitchell, pilot.

State Department sends USBR engineer to Cairo

T. W. Mermel, engineering assistant to the commissioner of reclamation, flew to Egypt recently to participate as an unofficial U. S. observer at the second International Technical Congress of the World Engineering Conference. The congress met in Cairo (ENR March 24, p. 21).

His trip resulted from a last-minute decision by the State Department to use this means of opening up another avenue for exporting U. S. technical know-how to parts of the world that can utilize it to develop their resources. President Truman proposed that course in famous Point 4 of his inaugural address.

Previously the state department had chosen four attaches—agricultural and military—from embassies and legations abroad to attend the conference. To make a real U. S. contribution to the meeting, a reclamation engineer was needed.

An important part of the Congress program centers in water problems in the Middle East. The U. S. engineering representative will give to the sessions on that subject the benefit of reclamation experience in this country, including information on multipurpose projects. He will also talk to representatives of other governments in that area about the possibility of using U. S. technical help on irrigation, power and basin development in working out reclamation problems.

Lending an engineer to the State Department is not a new experience for the Bureau of Reclamation. On many occasions, the bureau has supplied engineers upon request to serve as advisers to foreign governments.

ECA sets up technical information division

The Economic Cooperation Administration last week announced that a technical assistant division to help Marshall Plan countries get Information on American production methods. Albert M. Pitcher, former vice-president of the Westvaco Chemical Corp., New York, heads the new unit.

Until now, the technical assistance program has been directly under the ECA director of operations. The new technical assistance division includes two branches—a program branch, headed by Jack E. Fobes, and an arrangements branch, headed by Elliott S. Hanson. A field office at 2 Park Avenue, New York, helps the latter branch take care of technical delegations from participating countries.

N. J. plan offers incentive to low-cost home builders

A plan to entice builders into the low-rent housing construction field—by offering them 2-percent loans and a 6-percent profit—has been presented to the New Jersey legislature by Gov. Alfred E. Driscoll. He has asked passage of the measure, even if a special session must be called for the purpose.

Governor Driscoll's program calls for low-cost housing financed through self liquidating loans to builders. Some 45,000 rental units available at $50 per month to persons with incomes under $3,000 are wanted.

A $100 million bond issue to be voted on next November would back the sale of State Housing Authority bonds to banking agencies at a low enough rate, so that they, in turn, could lend to the builders at two percent. Construction would be limited to slum clearance, and tax abatements for periods as long as 50 years would be granted to builders and development corporations. Profits on investments would be held to six percent and the tax abatement would not apply on developments of other than "blighted areas."

The Governor wants construction started by summer.

PERSPECTIVE • • •

A beginning for Point 4

Washington is now looking upon a report recently submitted by the Joint Brazil-U. S. Technical Commission as a probable beginning point for President Truman's proposal to help under-developed areas.

The commission was under the joint chairmanship of Dr. Octavio Gouvea de Bulhoes, of the Brazilian Ministry of Finance, and John Abbink, former chairman of the McGraw-Hill International Corp.

With the report out, the next move will be to make some decisions. As a first step, the State Department will see that interested agencies study the report and make time Brazil may be expected to take recommendations. At the same similar action, particularly because the report makes it clear that the Brazilians themselves must do most of the work of raising their country to a higher economic plane.

Discussing Brazil's economy from an overall point of view, the report warns that further development of industry and agriculture is pendable sources of fuel and power not enough. Larger and more demust be found; more efficient transportation provided; a larger supply of skilled labor must be trained; and more technical and managerial talent is needed.

Since there is practically no unemployment in Brazil and little supply of labor and materials will surplus manufacturing capacity, the limit the country's ability to carry out development projects.

The lesson to be learned here, the commission suggests, is that a development program "will probably require modest beginnings," and that it should be in balance at the start, with most urgent needs being dealt with first.

That won't be easy because some of the most pressing requirements—such as improved transportation—call for large investments of capital in industries which don't look like good risks.

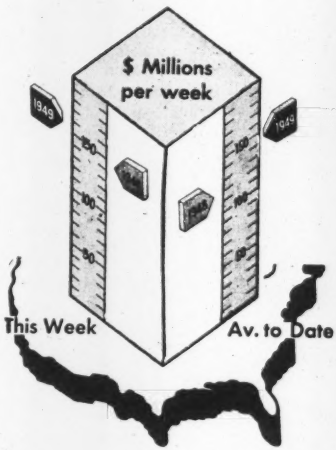
Another point made by the commission is that wood accounts for more than four-fifths of Brazil's energy production, the remainder coming from hydro-electric power, imported petroleum and domestic and imported coal. Though the quality of the country's coal is poor, it could be improved by the use of suitable cleaning equipment.

More hydro-electric capacity is obviously needed, as recognized in the government's own long-range, $950 million Salte development plan. This would alone increase installed capacity over a six year period from 1.5 million to 2.8 million kilowatts.

To finance the development, the commission recommends increased tax revenues; use of domestic borrowing to finance education and health programs, re-direction of private savings by modifying laws and regulations setting lower limits on the percentage of bank and institutional reserves; strengthening of foreign credit standings; granting special inducements to favored investments, and a cooperative arrangement whereby both the U. S. and Brazil would offer guarantees to private U. S. investors.

ENR INDEX NUMBERS

Index Base — 100		1913	1926
Construction Cost	Apl.'49	473.54	227.63
Building Cost	Apl.'49	351.35	189.93
Volume	Mar.'49	271	119



Activity This Week

As reported to ENR

(in millions of dollars)

Amount of Contracts let

	Week of Apl. 14 1949	Cumulative 1949 (15 wks.)	Cumulative 1948 (16 wks.)	% chge av.wk.
Federal	$11.9	$341.5	$347.2	+5
State & Mun.	71.4	755.1	628.6	+28
Total Public	$83.3	$1,096.6	$975.8	+20
Total Private	74.9	1,112.3	906.0	+31
U. S. Total	$158.2	$2,208.9	$1,881.8	+25

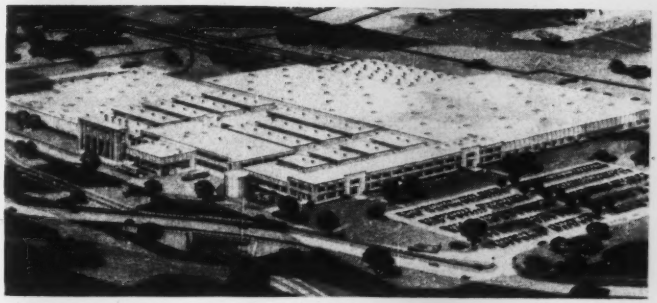
Contracts by type of work

	This Week	Cumulative 1949 (15 wks.)	Cumulative 1948 (16 wks.)	% chge av.wk.
Waterworks	$3.8	$40.8	$49.8	−13
Sewerage	7.7	62.2	56.9	+17
Bridges	11.4	102.7	84.2	+30
Highways	12.5	153.7	237.7	−31
Earthwork, Waterways	2.4	175.8	156.9	+20
Buildings, Public	36.8	486.8	324.3	+60
Industrial	7.8	315.3	301.8	+11
Commercial	64.0	705.9	526.8	+43
Unclassified	11.8	165.5	143.5	+23

NOTE: Minimum size projects included are: Waterworks and waterway projects, $28,000; other public works, $50,000; industrial buildings, $68,000; other buildings, $250,000.

New capital for construction

	Cumulative 1949 (15 wks.)	Cumulative 1948 (16 wks.)	% chge av.wk.
NON-FEDERAL	$1,439.9	$1,011.5	+52
Corporate Securities	679.7	586.6	+24
State and Municipal	760.2	429.9	+91
Total Capital	$1,439.9	$1,011.5	+52



FACTORY ON PRECAST FOUNDATIONS—Precasting all footings, grade beams and walls, the Wigton-Abbott Corp. of Plainfield, N. J., has begun construction of this 700,000-sq. ft. plant near Pittsburgh. A Continental Can Co. factory, it will have a structural steel frame, concrete floors and steel roofing. To speed construction, precast grade beams will be used, spanning between precast piers on 20-ft. centers. After floor has been poured, precast spandrel wall sections 20 ft. by 3 ft. 11 in. will be erected.

State building code asked to aid Wisconsin housing

A major step toward speeding private construction of housing was offered in the Wisconsin Senate recently in a bill proposed by the veterans' affairs committee.

This bill would provide state regulation of dwelling standards, and would oppose "restrictive trade and labor practices" by use of the state anti-trust law.

The measure denounced "monopolistic practices" in the building materials business. It charged that bans on labor saving machinery and prefabricated units unnecessarily increase the costs of homes.

Canadian building code discussed at conference

The National Building Code of Canada was the subject of a recent two-day conference in Ottawa under the auspices of the National Research Council. The conference was attended by representatives of over 40 leading Canadian municipalities, most of the provincial governments, and interested departments of the federal government.

The code was issued in 1941. It is in use, to some degree, in more than 30 municipalities. With the start of the new Division of Building Research of the council, steps have been taken to bring the code up to date.

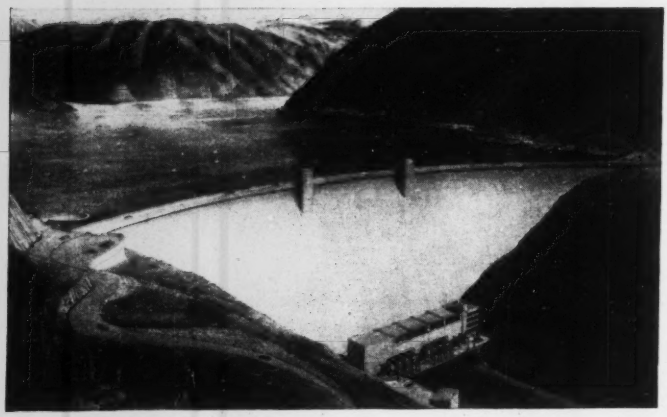
For this purpose a new associate committee of the N.R.C. has been formed and the meeting was its initial activity. The urgent need was expressed for a pocket-sized edition of the building code for use on residential construction.

Utah's governor cuts construction funds

Utah's Gov. J. Bracken Lee has vetoed appropriation items that provided funds for some $9,000,000 worth of building projects, virtually eliminating all funds for state construction other than that already under way.

He vetoed in entirety a $5,170,000 building program passed by the recently adjourned state legislature.

FACED WITH ALUMINUM, the spandrel walls of this apartment building are three courses of cinder block; all else is reinforced concrete. David Rose is builder of the 850-unit development still under way in Forest Hills, N. Y. Leo Stillman is the architect, Victor Mayper, the engineer. A .22 caliber gun "shoots" studs into concrete for fastening the metal facing. Formwork is handled by 100-ft. cranes.



Hungry Horse Dam . . .

. . . Will Plug Flathead River Gorge

Max Ford
Engineer, U. S. Bureau of Reclamation
Denver, Colorado

With the arrival of spring, work on Hungry Horse dam will go on a full-speed basis for the first time. Representing the largest single U. S. Bureau of Reclamation contract now underway, and the fourth largest concrete dam in the world, work on Hungry Horse has been of a preparatory nature — building roads and housing, driving a diversion tunnel and stripping abutments. Now that the stage has been set, the contractor plans on diverting the river after the spring floods and to start concrete operations late this summer. Total contract time is more than 5½ years.

The $43,431,000 contract for construction of the dam and power plant was awarded April 21, 1948, to a group of 12 contracting firms incorporated under the title of General-Shea-Morrison Co. Construction started June 7, 1948.

A part of the Columbia River system development, the dam is to be located in northwestern Montana on the south fork of the Flathead River. The dam will be the world's largest with a glory-hole spillway. A flyash pozzolan will be added to the concrete.

The physical dimensions of the dam are exceeded only by those of Grand Coulee, Hoover and Shasta Dams. Rising 520 ft. from the lowest point in the foundation, the dam will contain 2,900,000 cu.yd. of mass concrete, exclusive of concrete in power plant, spillway and other structures. The dam is to be a variable-thickness, arch-type structure, having a constant upstream radius of 1,200 ft. Due to the comparatively flat arch, the minimum downstream slope at the line of centers will be 0.6 to 1.

The total length at the top of the dam is about 2,100 ft. and the width is 39 ft., accommodating a 30-ft. roadway and two sidewalks. A gross storage capacity of 3,500,000 acre-ft. will be provided, and 2,980,000 acre-ft. of this will be active storage to be used for power generation, flood control and future irrigation needs.

The power plant will be a reinforced concrete structure located at the toe of the dam in the original river channel. The power installation will consist of four vertical-shaft 75,000-kva. generators, each connected to a 105,000-hp. turbine operated under heads from 260 to 479 ft. The turbines are to be served by 13-ft. 6-in. dia. penstocks that will have emergency controls consisting of fixed wheel gates operated by manually-controlled hydraulic cylinders installed at the upstream face of the dam. In addition to a power plant service road, access to the plant will be possible from the top of the dam by elevators.

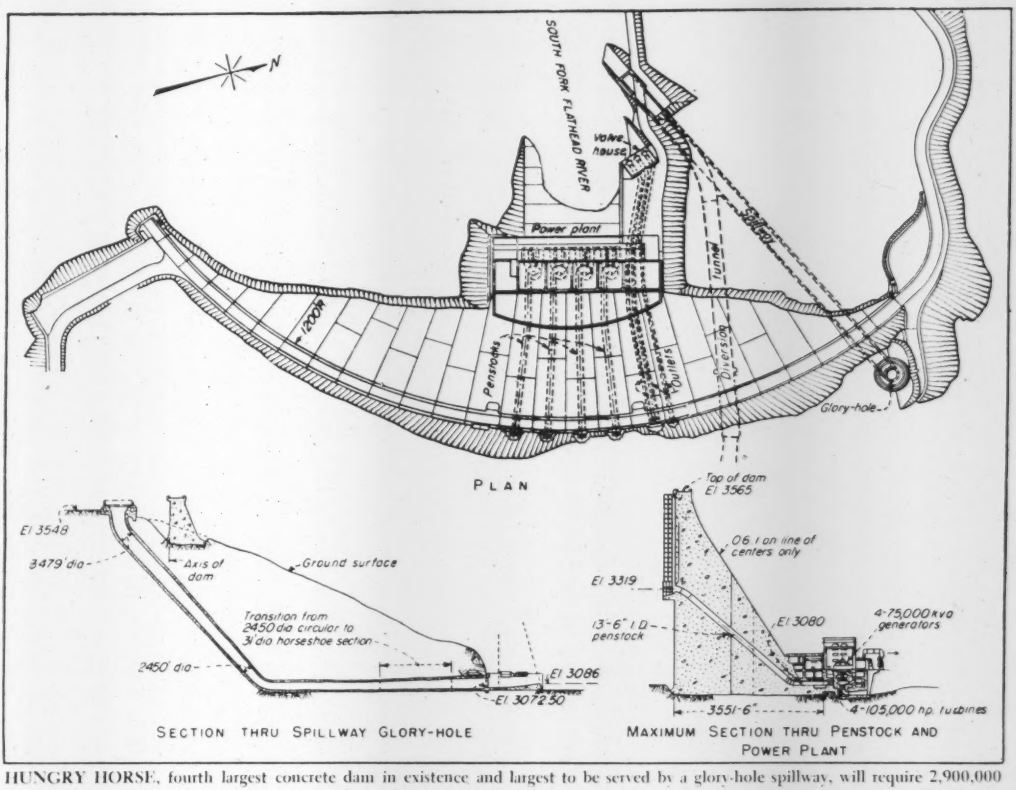
Construction schedule

Maximum river flow usually occurs during late May and June. Climatic conditions are such that work must be held to a reduced rate between about November 1 and March 15 because of cold; concrete placing will be stopped during winter months.

This winter, however, it has been necessary to carry on drilling operations and other incidental work to meet the schedule. The contractor has established a rule of no work when the temperature at 8 a.m. is below 0 deg. F. During January the job was shut down about half the time.

The construction schedule must also be keyed to meet the specification requirement of storing a usable supply of 1,000,000 acre-ft. of water from the 1952 seasonal runoff.

To date no concrete has been placed for the dam and power plant, but about 400,000 cu. yd. of rock have been excavated for the foundations of the dam and the excavation for the



HUNGRY HORSE, fourth largest concrete dam in existence and largest to be served by a glory-hole spillway, will require 2,900,000 cu. yd. of concrete and is scheduled for completion by the end of 1952.

spillway tunnel is about 40 percent completed. The contractor's tentative mass concrete placement program for the dam is: 1949—250,000 cu.yd., 1950—1,000,000 cu.yd., 1951—1,000,000 cu.yd. and 1952—650,000 cu.yd.

Concrete will be placed from a half-mile-long cableway similar to that used at Shasta Dam. In fact the main cables from Shasta are being used at Hungry Horse to brace the main tower.

A new mixing plant will have four 4-cu.yd. mixers; buckets of 8 cu.yd. capacity. Aggregate will be carried by a fleet of specially designed trucks from a deposit 5½ mi. from the dam. All other materials will be shipped to the job by rail and truck.

To reduce the large cement requirements, specifications require that the contractor use flyash (or a pozzolanic material that will produce equivalent results) in the concrete. The flyash is a finely divided dust precipitated from the stacks of certain steam power plants burning pulverized coal, and is well known as an active pozzolan. Laboratory tests indicate that satisfactory concrete mixes can be obtained with as little as 2½ to 3 sacks of cement per cubic yard of concrete if additions of flyash are made in the mix. It is contemplated that 30 percent of flyash by weight of portland cement will be used. This compares with 20 percent used at Davis Dam (ENR Feb. 3, 1949, p. 62).

Glory-hole spillway

The principal hydraulic features in the construction of the Hungry Horse are the spillway and spillway tunnel. The spillway is to be near the right end of the dam and will be of the glory-hole type, topped by a 64-ft. dia. by 12-ft. high ring gate. Choice of the spillway type was dictated by conditions such as the narrow canyon width available for the power-house. Desire to restrict the energy involved in the drop and the relative soundness of the natural rock formations were also taken into account.

The river will be diverted through a 36-ft. unlined horseshoe tunnel driven through the rock of the right abutment a distance of about 1,150 ft. This tunnel was completed in June, 1948, under a separate contract by the Guy F. Atkinson Co. (except for the concrete intake structure which has since been constructed by General-Shea-Morrison.)

The spillway tunnel, also at the right abutment, will be lined and will have a circular section varying from 34.79 to 24.50 ft. in diameter. Since spillway and diversion tunnels join near the outlet, the diversion tunnel will be lined from this junction to serve as part of the spillway, after the diversion tunnel is plugged.

Although the maximum computed design flood inflow was 80,000 sec. ft., the spillway capacity was reduced to 53,000 sec. ft. by providing reservoir outlets and by planning operations to permit the reservoir to rise a maximum of 5 ft. above normal high water surface during maximum flood.

The recent floods on the Columbia River and its tributaries emphasize the importance of flood control in the

DRILLING CREWS have dominated construction work thus far. Almost a million cubic yards of excavation is involved in the stripping and tunnel work.

Columbia Basin. The 1948 Spring flood on the south fork of the Flathead River approached a near-record of some 40,000 sec. ft., with great damage resulted in the Kalispell, Mont., area, a few miles downstream.

The contemplated plan of operation (summer storage and winter generation) for maximum development of firm power lends itself ideally to flood control contributing to the control of the Columbia River. The reservoir will normally be somewhat drawn down when the spring runoff occurs; and, if snow surveys and winter climatic data indicate an abnormal runoff is in prospect, the lake could be emptied to a level below the normal power drawdown.

Flood changes design

The original specifications called for two 96-in. dia. outlet conduits for regulation of outflow during normal operation. However, after the flood disaster in the lower Columbia River region last spring, the Corps of Engineers added a third 96-in. dia. outlet conduit. Greater discharge capacity will thus make possible quick evacuation of the reservoir in the face of an impending flood.

The three outlet pipes will extend through the dam and the substructure of the power plant to a valve house located on the right bank of the river channel, about 200 ft. downstream from the power plant. Discharge will be controlled by hollow-jet valves in the valve house, and ring-follower gates located in the mass-concrete foundation of the power plant. A bulkhead gate is provided for emergency or maintenance work and will be lowered from the top of the dam by a 150-ton gantry crane. The gantry crane will also be used to install the penstock fixed wheel gates and their hydraulic hoists, and for maintenance.

The rock foundation of the dam is an impure dolomitic limestone—dense, tough and moderately hard. Some bedding planes and joints are present that will in part control the character of the foundation excavation. Nevertheless the 36-ft. horseshoe diversion tunnel was excavated without the use of supports and with little overbreak.

The general plan for grouting the foundation under the dam provides for preliminary low-pressure shallow grouting, to be followed by intermediate and final high-pressure deep grouting. The preliminary low-pressure grouting will be completed prior to the placing of any concrete in the dam, through holes 20 to 40 ft. in depth and spaced at about 20-ft. centers each way in the area under the upstream one-third of the dam. Additional low-pressure holes in the area covered by the downstream portion of the dam and power plant are to be drilled and grouted where necessary.

The intermediate pressure grout holes are to be drilled through 2½-in. pipes, placed in the concrete fillet at the upstream heel of the dam to depths of 50 to 75 ft. The holes will be spaced on approximately 10-ft. centers, and no grouting will be done until the dam concrete has been placed to a minimum height of 25 ft.

The high-pressure grout holes are to be drilled to depths of 75 to 200 ft. on 5 ft. centers from the foundation gallery in the dam through 2½-in. pipes placed in the concrete. High-pressure grouting will not be started until the dam concrete has been placed to a minimum height of 200 ft. The minimum diameter of all grout holes will be 1⅞ in. Depending upon the character of the rock, packers will be used at various depths wherever it is necessary to vary the grouting pressure.

Foundation drainage is to be obtained by drilling 3-in. holes through 4-in. pipes placed in the concrete of the foundation gallery. The drainage holes, 50 to 75 ft. deep, will be on approximately 10-ft. centers, and no holes will be drilled until the foundation grouting is completed.

To keep tensile stresses to a minimum in the arch elements, it is planned to cool the mass concrete of the dam to 38 deg. F. before grouting the joints. This temperature is 5 deg. F. below the final average temperature of the dam. Stresses in the dam induced by the design loadings were determined by the trial load method of analysis. The analysis also included the effects of stresses due to construction and to contraction joint grouting.

The dam will have continuous transverse contraction joints from upstream to downstream face, spaced at 80 ft. intervals at the upstream face of the dam. Only one longitudinal joint in each row of blocks will be constructed in the central portion of the dam between transverse joints. However, this longitudinal joint will be staggered in adjacent rows. As on all recent USBR concrete dams, the concrete will be placed in 5-ft. lifts with shear keys on all of the contraction joints.

Systems of grout pipes will be installed in the mass concrete with outlets on the contraction joints for pres-

TABLE I—WORLD'S LARGEST CONCRETE DAMS

Name	Volume (cu. yd.)	Height (ft.)
1. Grand Coulee	10,493,000	550
2. Shasta	6,413,000	602
3. Hoover	4,400,000	726
4. HUNGRY HORSE	3,037,800	520
5. Fontana	2,812,000	480
6. Bull Shoals	2,100,000	278
7. Friant	2,045,900	320
8. Mettur (India)	2,000,000	230
9. Mansfield (Marshall Ford)	1,865,000	270
10. *Aswan (Egypt)	1,732,000	142

*Masonry

sure grouting after the mass concrete is cooled. As an added safeguard against leakage through the transverse contraction joints, formed drains will be constructed on the joints 10½ ft. from the upstream face. These open drains will be protected from intrusion of grout by asphalt seals while the grouting of the transverse joints is in progress. Since each grouting lift will have a maximum height of 50 ft., excessive grout pressures in the joints will be avoided.

Design loadings of the dam include a water load up to normal high water surface and an ice pressure of 5 tons per linear ft. of dam. These are combined with a horizontal force produced by an assumed earthquake shock. The acceleration of the foundation caused by the design earthquake loading was considered to act along the line of centers in an upstream direction. The effective shock was assumed to have an acceleration of 0.1 g and to have a period of vibration of one second.

Cooling by river water in winter

Artificial cooling with river water will be employed in two stages to lower the temperatures of the concrete so that shrinkage will be completed in time to permit grouting the joints as construction proceeds. The initial stage will begin immediately with the placement of concrete about the pipes and proceed for a minimum of 16 days. The second stage will lower the temperature of the concrete to the required 38 deg. F., and will take place during the winter when the temperature of the river water is low. It is estimated that the second stage cooling will require about 40 days.

The cooling system will consist of 1-in. pipes spaced 3 to 5½ ft., depending upon the size of the blocks. These cooling pipes will be placed on the foundation rock and on top of each successive 5-ft. lift. All of the concrete cooling operations and all of the contraction joint grouting operations, with the exception of some contraction joint lifts near the foundation, will be carried out from the downstream face of the dam.

Hungry Horse Dam and its power plant will constitute a key unit in a comprehensive, long-range program to insure full control and utilization of the Columbia River and its tributaries for agricultural and industrial development of the Pacific Northwest. Extensive studies were made by the Bureau of Reclamation and the Bonneville Power Administration to determine the economic height of the dam, and the cost of the project were balanced with the benefits expected from the firm power that is to be generated at the dam and at existing and contemplated downstream power plants.

THE DIVERSION TUNNEL OUTLET is located just below the right (north) abutment shown here in the early stages of excavation to bed rock.

THE CONSTRUCTION TOWN will ultimately house families of 1,000 workers. Bureau of Reclamation quarters are in the foreground and the contractor's camp beyond.

It is estimated that in addition to 208,000 kw. of prime power made available at Hungry Horse Dam, the prime power capacities of existing downstream power plants at Kerr Dam and Thompson Falls, Mont., and at Grand Coulee, Rock Island and Bonneville dams on the Columbia River, will be increased by 334,000 kw. In addition, 490,000 kw. of prime power will be added to capacities of power plants either authorized or contemplated for construction as part of the ultimate development of the Basin.

To obtain the maximum of prime power, the plan of operation contemplates that the project will be integrated into a single system with Grand Coulee, Bonneville and other federal projects for which the Bonneville Power Administration is the marketing agency. Operation will involve high-capacity generation during the winter months when the power is needed most and the water releases can be used to the best advantage at the downstream plants. In spring and summer months, when ample power is available from the downstream plants the project will store water and generate a minimum amount of power.

Hungry Horse Dam is being built by the Bureau of Reclamation, of which Michael W. Straus is commissioner. The engineering design and construction are under the direction of Leslie N. McClellan, chief engineer and Clyde H. Spencer is construction engineer for the project.

Contractor under the $43,431,000 contract is a combination sponsored by General Construction Co., Seattle, Wash., working under the name General-Shea-Morrison (same name used on Seattle City Light's Ross Dam on the Skagit River). C. W. Woods is project manager. Other participating contractors are The Shea Co.; Morrison-Knudsen Co., Inc.; F & S Contracting Co.; J. L. McLaughlin; Pacific Bridge Co.; Walsh Construction Co.; S. Birch & Sons Construction Co.; Peter Kiewit Sons' Co.; The Kaiser Co.; I. C. Boespflug Construction Co.; and Gilpin Construction Co.

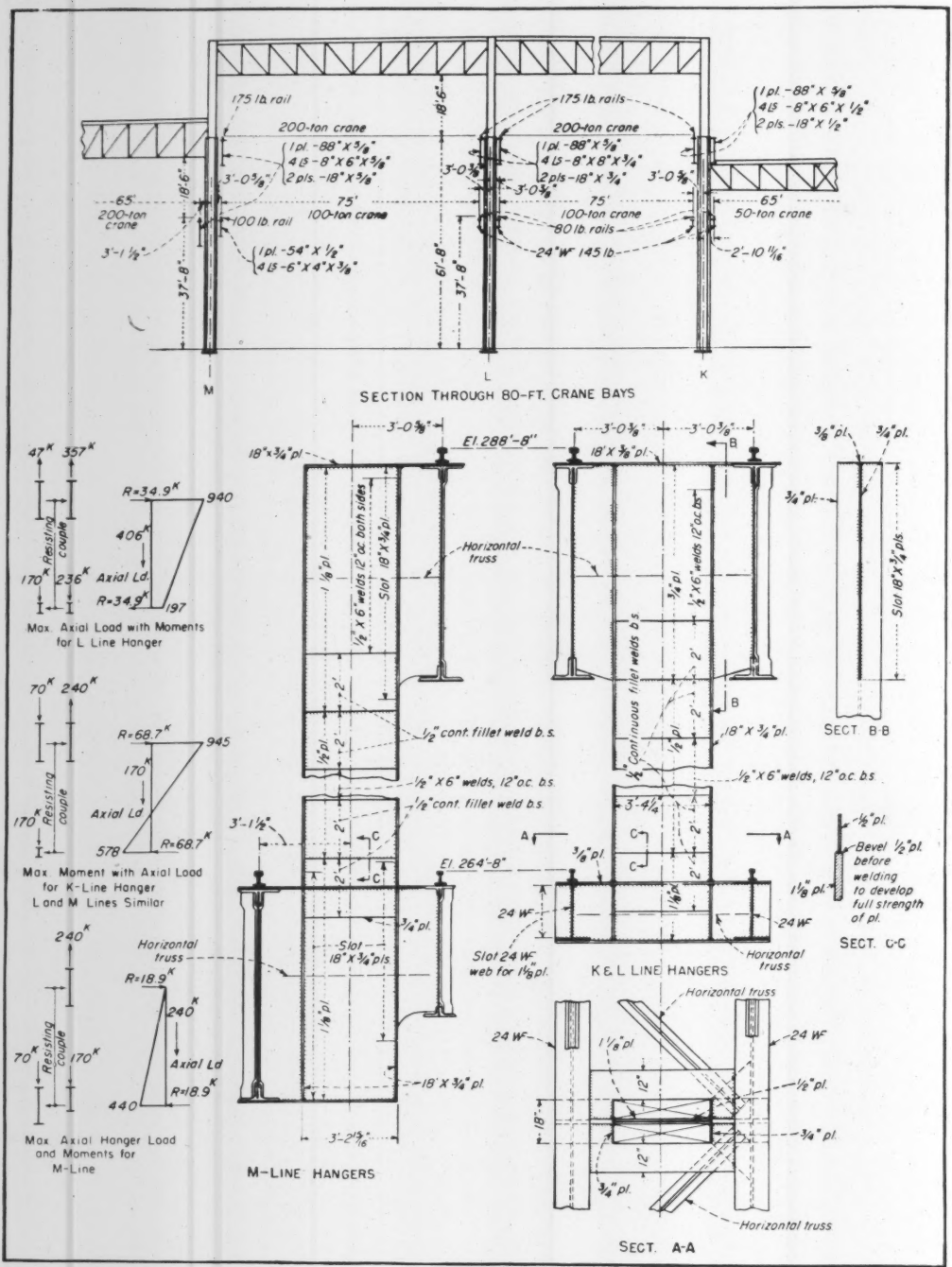

SECTION THROUGH 80-FT. CRANE BAYS
Max. Axial Load with Moments for L Line Hanger
Max. Moment with Axial Load for K-Line Hanger L and M Lines Similar
Max. Axial Hanger Load and Moments for M-Line
M-LINE HANGERS
K & L LINE HANGERS
SECT. A-A
SECT. B-B
SECT. C-C
Horizontal truss
Slot 24 WF web for 1⅛" pl.
Bevel ½" pl. before welding to develop full strength of pl.

FIG. 1. SECTION AND DETAILS of 80-ft. crane-bays in the General Electric Co. turbine manufacturing plant at Schenectady, N. Y. Two levels of crane girders were installed, the lower suspended from the upper by hangers at the third points.

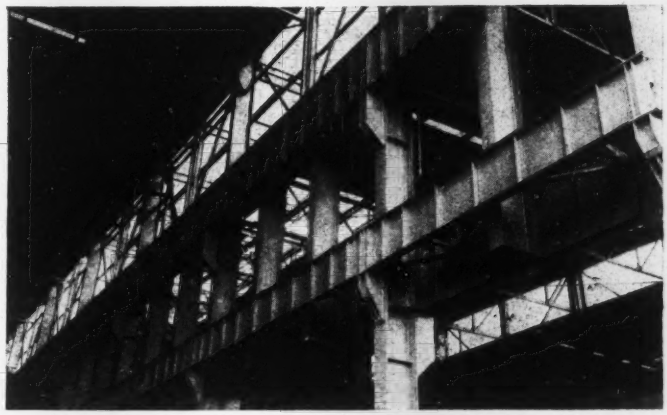


FIG. 2. AT THE M COLUMN LINE in the turbine plant, a plate girder proved economical at the lower level in the 80-ft. bay. Conditions differed from K and L lines where hangers permitted use of rolled sections.

Girders Act in Unison To Support Cranes at Two Levels

To SOLVE a headroom problem in the world's largest turbine manufacturing plant, designers called for third-point suspension of the obstructing crane girders, from crane girders at a higher level. This framing scheme made it possible to reduce the size of the lower-level members so that rolled sections could be used instead of plate girders.

The limited headroom in two bays of the plant presented this dilemma: Two crane runway levels had to be provided in each bay, while maintaining specified clearances and heights of rail from the floor. Design calculations indicated that insufficient depth was available at the lower level for a simple girder capable of carrying the crane load.

The two bays are 80 ft. wide and extend the full length of a 650x1,290-ft. field-welded, steel-frame factory recently built for the General Electric Co. in Schenectady, N. Y. In the longitudinal direction, columns are 40 ft. apart.

There are 51 traveling cranes in the building, varying from ½ to 200 tons in capacity. No problem was presented in bays where there was only one level of cranes. In the two 80-ft. bays, however, two runway levels were required—the upper one for 200-ton cranes and the lower for 100-ton cranes. Clearances in the K and L column lines (Fig. 1) were too high for a simple girder to carry the 100-ton crane on the 40-ft. span while maintaining the height of rail originally established.

The problem was solved by suspending the lower-level girders from the upper. Hangers placed at the third points of the span permit the use of 24-in. rolled sections, which are sufficiently shallow to satisfy the headroom requirements.

Horizontal trusses, placed at each runway level to resist the horizontal crane thrust, also resist rotation of the hangers and were designed for this additional force. With the hanger maintained in a vertical position, all loading is divided equally between the upper girders. This results in an appreciable economy in steel.

At the M column line, where a third 200-ton crane runway is located on the opposite side of the column line from the double runways, but at the level of the lower runway in the 80-ft. bay, the two main supporting girders are of necessity at different levels. It is desirable, however, to locate the horizontal trusses at the neutral axis of the girders to which they frame. If a 24-in. rolled section had been used in this instance for the lower girder in the 80-ft. bay, the truss located at the midpoint of the 88-in. girder would have required a separate member for its chord in this bay. Substitution of a 54-in. deep plate girder for the rolled section and truss chord resulted in a slight reduction in weight over the two separate members, clearance conditions at this column line permitting this depth of member. This plate girder was designed to act in bending only between hangers in the same manner as the rolled sections on the other lines.

On the K line where there is no 200-ton crane runway on the opposite side of the column, it was found economical to use a dummy girder at the high level.

In the design of the crane girders, higher stresses than normal were permitted under loads imposed by fully loaded cranes in the same bay on both runways at the same column line. It was considered that the occurrence of this condition is improbable.

Headroom problem

After the preliminary design had been completed, it was found desirable to increase the height to which the hook on the lower crane could be raised, and the headroom problem was no longer serious. Nevertheless, because of its economy, the original design was retained.

Details of the hanger connections are shown in Fig. 1. Particularly noteworthy are the use of welding and of diaphragms for the full depth of the girders.

(Other details of the design and construction of this plant were given in "Concrete Jacketing H-Piles in Soft Mud," ENR Feb. 5, 1948, vol. p. 179; "Vibration Testing of Friction Piles," ENR May 13, 1948, vol. p. 715; and "Insulated Stainless Steel Panels Inclose 4-story Office Building," ENR, 1949, p.)

Design and construction of the turbine plant were carried out for the General Electric Co. under the supervision of the General Electric Realty Corp. by Stone and Webster Engineering Corp.

LARGEST WELDED FACTORY

The new General Electric Co. turbine manufacturing plant at Schenectady, N. Y., is believed to be the largest field-welded industrial building in the world. Having over-all dimensions of 650 x 1,290 ft. and a total floor area of 1,027,986 sq. ft., the superstructure contains 14,800 tons of structural steel. Below ground, there are 13,300 tons of steel in 4,700 H-piles, 80 to 140 ft. deep. Roof trusses and some of the smaller columns were shop welded.

How to Dispose of Fluorescent Tubes Safely

To minimize health-hazardous inhalation of beryllium dusts—contained in fluorescent-lamp tubes, various methods for safe disposal of such tubes have been developed by beryllium-compound suppliers, insurance companies and a number of state boards of health.

Recent medical literature has been studded with reports of serious changes in the lungs of workers exposed to dust containing various beryllium compounds.

Recommended methods for disposal of fluorescent tubes as well as the possible hazards of exposure to beryllium dusts are outlined by Louis W. Spolyar, M.D., in a recent issue of the Monthly Bulletin published by the Indiana State Board of Health. Dr. Spolyar is director of the division of industrial hygiene for that Board.

Acceptable disposal methods, which may be selected on the basis of number of tubes to be destroyed, are:

(1) Burned-out fluorescent tubes are dropped through a slot in the floor above into an inclosed, ventilated crusher. Broken glass is removed wet. Exhaust passes through a collector; captured dust is wet down and removed. Used by tube manufacturers themselves, this is the best method of disposal where hundreds of tubes are replaced each day.

(2) Tubes may be broken in a ventilated hood by a crowbar or piece of pipe. The ventilated hood should be inclosed on all sides except the working front and designed so that the operator cannot enter. Face velocity of intake air should be maintained at 150-200 fpm. Exhaust air should pass through a collector in which dust can be wet down. Wet dust should be removed with minimum handling. A grated floor in the hood will allow broken glass to drop into a hopper where it can be wet down and removed.

(3) Where a small number of lamps are consumed, fluorescent tubes may be placed in a burlap bag, immersed in a trough or shallow tank of water and broken with a crowbar or pipe. The buoyant tubes must be weighted down. The wet bag plus the crushed contents is removed and dumped.

(4) Another method for disposal of fluorescent lamps in small quantities is recommended by the New York State Department of Labor's Industrial Hygiene Division. Two parallel bars are placed in an open-end oil drum about one-third height above the bottom as part of a removable frame. With the drum about two-thirds full of water, individual tubes are inserted between the bars and snapped off below water level. A removable wire-mesh basket, just small enough to fit inside the drum, is utilized to catch broken glass. Water with beryllium particles is poured to waste with care. (5) In the open, where released phosphor dust and mercury vapor will be quickly dispersed by air currents, fluorescent tubes may be broken individually in cardboard jackets with a pipe or crowbar. The operator should stand to windward and wear goggles as well as heavy canvas or leather gauntlets. (6) Disposal of fluorescent tubes by incineration should not be practiced. (7) Fluorescent tubes used in the home should not be broken but should be placed in a tall trash container intact. The short-length tubes lend themselves to "disposal intact." The trash container should be high enough to prevent small children from removing tubes.

Dr. Spolyar calls attention to the fact that the tubes are under vacuum and will **implode** when broken, but occasionally will **explode.** Thus, in any disposal method—wet or dry—he warns that operators must wear goggles and heavy gauntlets.

Health hazards

Dr. Spolyar says most of reported cases of lung damage occurred in plants manufacturing fluorescent-lamp tubes. Controlled manufacturing conditions, he commends, now limit exposure.

The disposal of fluorescent-lamp tubes containing beryllium and phosphor dusts offers three health hazards: (1) Inhalation of the beryllium-containing dust may cause changes in the lungs. The changes include pain in the chest, shortness of breath, cyanosis (formation of a bluish substance) and fluid in the lungs. This condition may last three weeks or more. (2) The phosphor dust containing beryllium might gain entrance into a wound sustained by breaking a tube. If all the beryllium compound is not removed, healing will be delayed and the wound may not close for several months. It appears that the beryllium contaminant in the wound produces a granuloma (a morbid growth resembling granulated tissue) with irregular areas of necrosis (gangrenous tissue). (3) It has been demonstrated that fluorescent tubes contain some free mercury. Thus a potential hazard of mercury poisoning exists.

Lamp manufacturers originally included about 12 percent beryllium as a component of the phosphor powders. This percentage was reduced to about 2 percent in 1943, he reports.

The beryllium compound used in the manufacture of fluorescent tubes is reported to be manganese beryllium silicate (Skin Lesions in Persons Exposed to Beryllium Compounds, R. S. Grier, Peter Nash, and D. G. Ferimen, Indus. Hyg. and Tox. #30: 228-237, July 1948).

Shortcut publication Of building ordinances

In order to bypass the excessive cost of publishing building code ordinances before they can be adopted as law, 15 states have now passed enabling acts to authorize municipalities to adopt codes by reference.

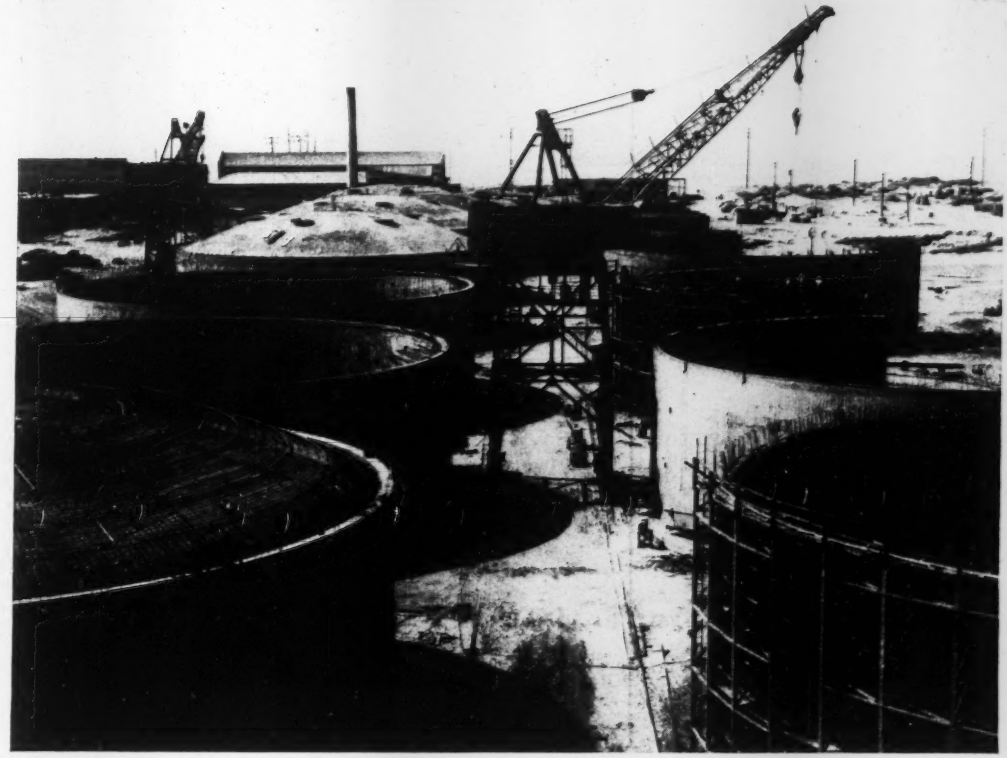
According to the American Society of Planning Officials, the states that have enacted this legislation include: Alabama, California, Idaho, Illinois, Minnesota, Nebraska, New Hampshire, New Jersey, New Mexico, North Dakota, Oregon, Pennsylvania, South Dakota, Utah and Washington.

Many cities have deferred adoption of model standards and codes because of their prohibitive publication costs. For example, in Colorado, where cities are required to publish codes in full twice in a newspaper, it costs a city about $2,200 to adopt the uniform Pacific Coast building code.

Under the recently passed state legislation, cities may merely adopt a brief law referring to the technical code by title and date. Then the ordinance is published in the newspapers in the regular manner as required by law.

In its recent publication, "Suggested State Legislation," the drafting committee of the Council of State Governments recommended that all state legislatures consider the adoption of a statute allowing building codes to be adopted by reference. The Housing and Home Finance Agency, in cooperation with other interested groups, has recently developed a model bill that is believed to be more advantageous in several respects that some of the existing statutes.

The full text of the statute is available in Technical Bulletin No. 7, published by HHFA.



ASSEMBLY-LINE ERECTION of eighteen large sludge digestion tanks speeds construction at the Los Angeles sewage plant.

Hyperion Digesters Are Mass-Produced

"MASS PRODUCTION" of the 18 sludge digestion tanks for the Los Angeles sewage treatment plant has been made possible by use of steel forms permitting efficient concrete placing and because the design included a wire-wrapped prestressing system. This prestressing permits the 33-ft. side walls of the 111-ft. dia. digesters to be cast in quarter-sections with vertical joints. The tanks will have conical bottoms and domed roofs.

The $3,991,000 contract—held by the Pacific Bridge Co.—for construction of the digester system at Hyperion is only one of several contracts now under way on the new 245-mgd. activated-sludge plant (ENR May 29, 1947, vol. p. 874). Other work in progress on the plant—intended to remedy the pollution of 10 miles of beaches—includes a mile-long, 12-ft. dia. outfall (ENR Aug. 5, 1948, p. 64), a headworks building, a filter and dryer building, primary settling tanks, a power and blower building, and the moving of 14,000,000 cu.yd. of sand from the plant site.

Two alternates were allowed for the tank walls when bids were called: tanks of conventional reinforced concrete design, or tanks built by the wire-wrapped prestressing system. For each alternate, three different roof systems were permitted: fixed steel covers, flat slab and girder roof and the accepted reinforced concrete domes.

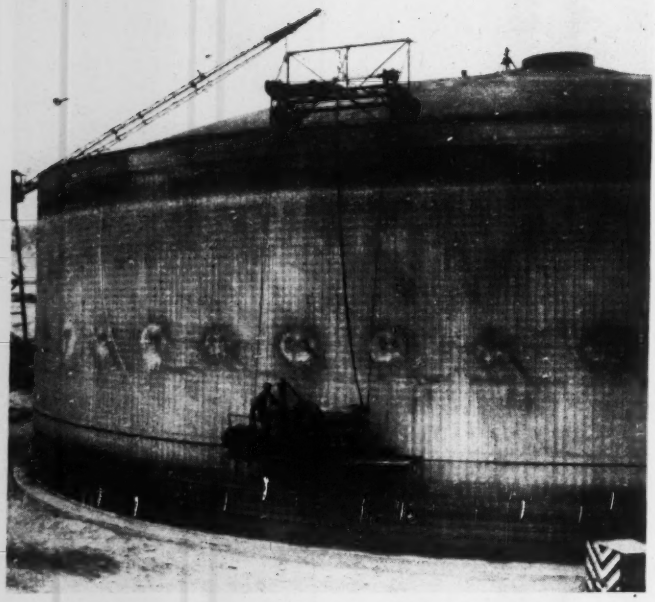
Stressing procedure

Relatively thin shells (6- or 8-in.) are permissible in wire-wrapped tanks, because of prestressing, but at Hyperion engineers specified a thickness of 20½ in. inside of the wire wrapping, for easier construction and more effective heat insulation.

Wrapping wire used is initially 0.162 in. dia. During the wrapping the wire is drawn down to a diameter of about 0.142 in. The stressing increases the length of a 350-lb., 3,700-ft. wire bundle to 6,000 ft.

In this manner a stress of 130,000 to 150,000 psi. is initially put into the wire. This is well within the elastic limit of the wire, the yield point being at 165,000 psi. and the ultimate strength 200,000 psi. Some 20,000 to 30,000 psi. of the stress is lost after the wire is placed due to normal concrete shrinkage and plastic flow, but stress in the wire will be above the 100,000 psi. required by specifications.

Because pressure of sludge is greater toward the bottom of the tanks, wires are spaced closer together near the



THE WIRE-WRAPPING MACHINE travels up to 7 mph. Form bolts penetrate the concrete only at the bottom and mid-height as indicated by the patches.

base than at the top. This spacing varies from 74 wires per foot at the bottom to a minimum of twelve wires per foot in the top 7 ft. Three layers of wire are required where more than 60 wires are placed per foot of wall height, and two layers where more than 30 are placed per foot.

Dome wire-wrapped first

With a heavy concentration of wires around the top of the wall at the tank dome, a domed roof with a circular section and a thickness of only 5 in. can be placed. This requires a band of 200 wires within a 2-ft. height to effectively restrain the dome.

The dome rises 13.86 ft. in the 110.92 ft. diameter. It is a true circular section with a radius of 117.85 ft. (A similar dome was installed in the repair of a 164-ft. dia. water tank at Halifax, Nova Scotia, ENR Aug. 7, 1947, vol. p. 187).

The success of wire-wrapping depends upon the machine used to place the wire. This machine is suspended from a two-wheeled, rubber-tire guide that rides the top of the tank wall, the guide being attached by wire cables to a tripod bolted to the center of the dome. Four rubber tired wheels bear against the side of the tank. Cables from the guide lower and raise the machine. Motive power is a four-cylinder gas engine that pulls against a chain circling the tank, making it possible to attain speeds up to a top of 7 mph.

The wire is mounted on a reel and fed through a carboloy-inset die. Insets vary in size (0.140, 0.141 and 0.142 in.) depending on stress desired.

DIGESTER WALLS are cast in a groove that is 5 in. wider than the unstressed wall.

A clamp attaches the ends of two reels of the wire together and the effect is one continuous strand for the full height of the tank. To insure continuity in case of a break, two adjacent strands are clamped together, each twelve strands or so. Besides this, occasional strands are bolted into the side of the tank.

Sets of forms that permitted construction of a quarter section of the tank at a time were used during construction. By using four sets of inside and three sets of outside forms, the work proceeded so that about one-quarter section was poured per day.

Each set of forms broke down into three separate sections that could easily be moved by 50-ton capacity revolving gantry cranes. Outside and inside forms were bolted together at the top, the middle, and the bottom. Thus, only two rows of bolts—the middle and the bottom—go through the concrete. One and three-eighths-in. dia. bolts in pairs were used for this purpose. After forms were removed, these bolt holes were plugged with mortar.

Construction sequence

Briefly, construction sequence was this:

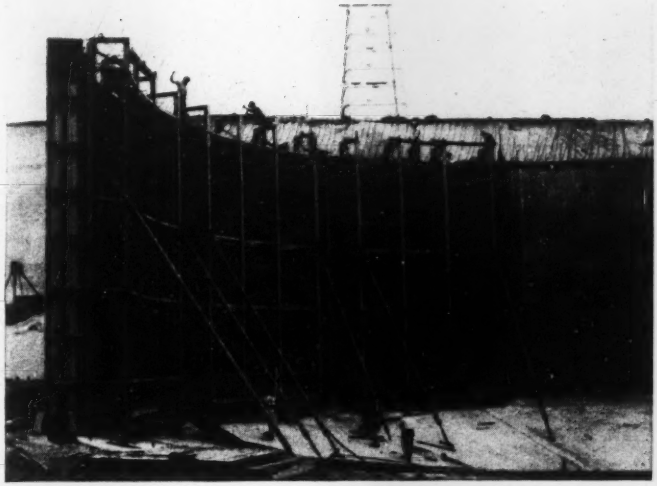
The site was graded and the sandy subgrade compacted. Then circular wall footings for the digesters were poured. Next an automatic excavating machine formed the subgrade for the conical bottom of the tank. The sand was firm enough so the concrete could be poured directly on the excavation.

The conical bottom was then poured in several pie-shaped sections, alternate sections being poured a day or so apart, with copper waterstop and expansion material between pours.

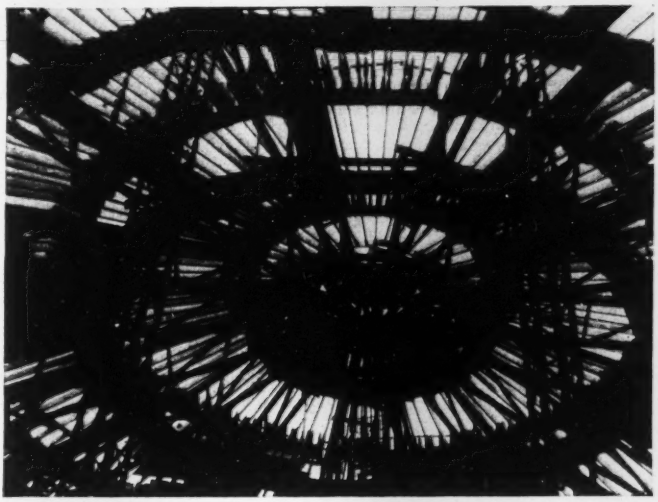
With the footing and conical bottom completed, the wall could be started. Inside forms were erected, then reinforcing steel was placed. Reinforcing steel was prefabricated in sections to minimize time required to set it in the forms—nine panels of reinforcing were welded up in advance for each quarter section of the tank. Final step in preparing the forms was the setting of the outside panels.

Concrete was placed by 2-yd. buckets handled by the gantry cranes. Buckets were hauled two at a time on flat-bed trucks from the 2-cu.yd. capacity mixing plant at one edge of the working area.

Eight hoppers, leading into 10-in. dia. flexible chutes extending to the bottom of the form, were used for the concrete work. Each 2-yd. bucket of concrete was placed in a separate funnel, consecutive buckets progress-



THREE-SECTIONS of steel forms are used for one-quarter of the inside of a digester wall. Casting tanks in four parts is permissible because of wire wrapping.



SPIDER-LIKE TIMBER JOISTS for dome forms are supported by a steel truss and column system.

ing from one end of the quarter-section to the other.

Vibrator operators working in cramped quarters inside of the forms removed sections of pipe as the pour progressed and also vibrated the concrete. One man serviced two chutes.

Forms were left in place for a period of 24 hours or more, then moved to the next section. Each quarter-section was cured for seven days before the next section of the same tank was poured. A ¾-in. pipe with a ⅛-in. nozzles sprayed water continuously around the top of each tank for curing.

After a complete tank wall was poured, work started on forming the concrete dome. A steel-truss system on fabricated steel columns supported wooden forms.

Next step was wrapping the tank proper. After this was done, a coating of gunite was placed over the entire outside of the tank so that a minimum of ⅝ in. of gunite covered each strand.

Placing of the wire decreased tank diameter by about ¾ of an inch. To allow further shortening as plastic flow in the concrete takes place, the walls were cast in a trough in the footing some 5 in. wider than the poured wall. The portion of this groove outside the wall was filled with gunite. A rubberized asphaltic compound, covered with gunite was placed in the groove between the trough and the footing around the inside of the wall to permit further creep and make a watertight seal.

General contractor for the construction of the tanks is Pacific Bridge Co., San Francisco, Charles Bisordi, general superintendent. Subcontractors are Ofeco Construction Co. for mechanical and piping, Newbery Electric Co. for electrical work, and Rutherford and Scoubye for reinforcing steel fabrication. Including the subcontractors, an average of 175 men was employed on the job.

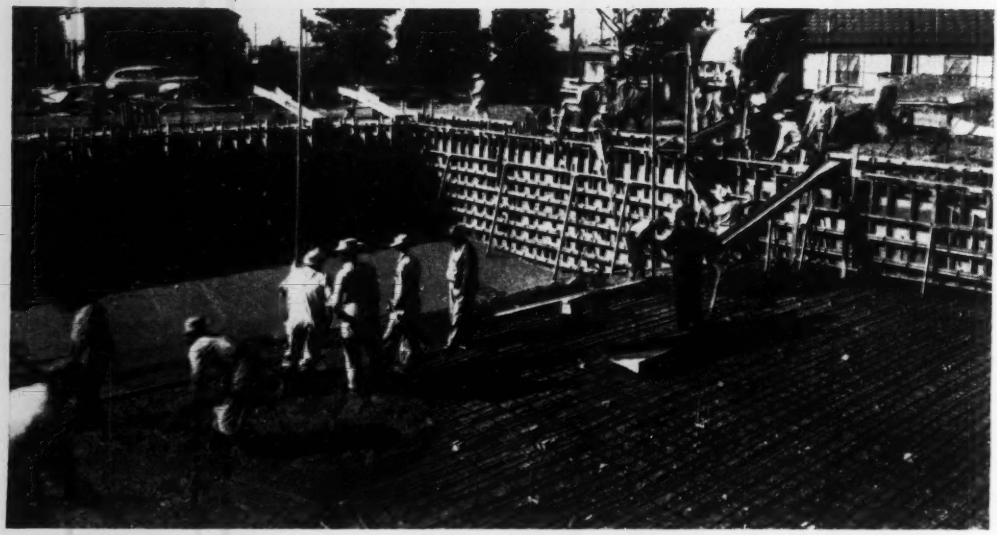
This work is part of the construction of the 245-mgd. treatment plant for the city of Los Angeles and is under the direction of Lloyd Aldrich, city engineer. Detailed direction for the city is by Merrill Butler, deputy city engineer for design.

Groundwater Study Methods Outlined in Report

A report describing methods for the solution of problems relating to groundwater flow in buried channels or other water-bearing formations of limited areal extent has been released by the United States Geological Survey.

The report is one of a series prepared by the Survey in cooperation with the Geological Survey Division, Michigan Department of Conservation. Methods employed in a statewide investigation of groundwater resources are demonstrated for the use of engineers, geologists, and hydrologists who apply results of field surveys and research to practical problems in design and development of groundwater supplies.

The report, entitled "Ground-water Hydraulics as a Geophysical Aid," by J. G. Ferris, issued as Technical Report No. 1 of the Geological Survey Division, is on file at the Federal Survey, 2209 Federal Works Building, Washington 25, D. C. Copies are available for distribution from the Geological Survey Division, Michigan Department of Conservation, 205 Capitol Savings and Loan Bldg., Lansing 68, Michigan.



A PANEL-HEATING SYSTEM was imbedded in the swimming pool for the Technical High School, Oakland, California.

Panel Heating for Swimming Pools

AN INVISIBLE radiant panel-warming system has been installed in the base slab of the Technical High School swimming pool, Oakland, Calif.

This system was adopted on the basis of eight-year operating experience that demonstrated these advantages over the conventional mixing of heated water directly with pool water:

(1) A reduction in heating costs of at least 40 percent;

(2) Elimination of upkeep costs for piping; and

(3) Maintenance of uniform temperatures from the bottom to surface of pool.

The radiant panel water-warming system consists of: A hot water boiler; a recirculation pump; a distribution header; 21 copper-tube coils and 21 returns in the pool floor and a collection header leading back to the boiler (Fig. 2).

The gas-fired boiler—rated at 1,920,000 Btu. per hr. and not less than 10,240 A.G.A. rating—is designed to put out water constantly at about 180 deg. F. maximum. The boiler is equipped with automatic gas valve, thermostatic safety pilot, automatic thermostatic boiler-temperature controller, a manually adjustable water-temperature regulator with a 120-240 deg. F. range, a gas-pressure regulator, and a combined pressure, altitude and temperature gage.

Hot water is drawn from the boiler and circulated through the panel-heating system by a 50-gpm., 20-ft. head centrifugal pump powered with a 220-v., 3-phase, 60-cycle induction motor. A magnetic, inclosed, across-the-line starter with no voltage and overload protection is equipped with a disconnect switch. The 120-v. circuit for the starter is carried to the pool thermostat—set to start and stop the recirculating pump at selected temperatures.

Exposed distribution header

The recirculating pump discharges into a distribution header located along one side of the pool. The exposed header, which decreases in diameter from 2.5 to 0.75 in. as the number of coil takeoffs diminish, is hard-temper, type L, copper water tube. A concrete block at the mid-point serves to anchor the exposed header and permit expansion in opposite directions from the center. The heavily insulated header is located in a trench under the pool deck.

Copper-tubing takeoffs, 0.75 in. in diameter, are located along the header to connect with the 21 irregularly spaced panel-heating coils. Fittings are wrought copper; all joints are made with solder containing 44-46 percent silver.

Tubing in base slab

Three coil systems and 21 returns, all of 0.75-in. soft-temper, type L, copper water tubing, are imbedded about 1.25-inch below the surface of the pool floor. Coils occupy about two-thirds of the pool floor while returns, which lead from the coils to the collection header, serve the remaining area (Fig. 2. The total length of imbedded copper tubing is about 9,000 lin. ft.

Coil systems—distinguished by the number of loops as well as loop spacing—are laid transversely in the concrete floor. In the diving area—the deepest and farthest section from the source of heat—the ten coils contain three loops spaced 7-in. apart. The portion of the diving area adjacent to the center of the pool has six coils, each with five loops spaced 7 in. on centers. The central section with an average depth of about five ft. is served with five coils, each with five loops on 12-in. centers.

Imbedded returns from all loops extend back parallel to the distribution header but on the opposite side of the pool and then transversely across

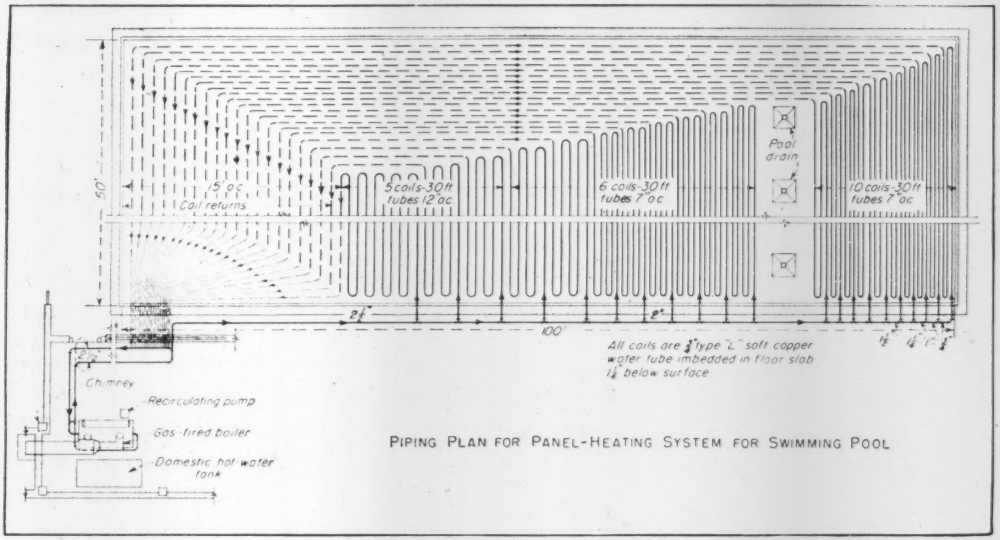

5 coils
Coil returns
5 coils-30 ft tubes 12 oc
6 coils-30 ft tubes 7 oc
Pool drain
10 coils-30 ft tubes 7 oc
50'
100'
All coils are ¾" type "L" soft copper water tube imbedded in floor slab 1½" below surface
Chimney
Recirculating pump
Gas-fired boiler
Domestic hot-water tank
PIPING PLAN FOR PANEL-HEATING SYSTEM FOR SWIMMING POOL

Fig. 2. PIPING, BOILER AND PUMP LAYOUT for the panel-heating system. Closest spaced coils are in deepest portions of pool. Return tubes heat shallow-water areas.

the pool at 15-in. spacing to furnish heat for the shallowest section. As the returns approach the edge of the pool, they are placed on a diagonal towards the corner, and concentrated in a bank for passage underground from the pool to the boiler room.

To insure uniform 1.25-in. depth below the pool-floor surface, coils and returns are laid directly on reinforcing bars (Fig. 1). Reinforcing was depth-positioned on small precast concrete blocks.

In the boiler room, the returns connect to a 2.5-in. collection header leading to the boiler. Each return is equipped with a gate as well as a balancing fitting with solder ground-joint union connections.

Exposed return piping is hard-temper, type L copper water tubing. All joints are formed with 44-46-per-cent silver solder.

Air-relief valves and drain valves are included at the highest and lowest points, respectively, in the piping system.

No leakage permitted

Before concrete was poured, the entire panel-heating system, including boiler, pump, mains and imbedded coils, was tested for leakage. (Fig. 3). This was done by closing the drain valves, filling the system with water and pumping up to a hydrostatic pressure of 50 psi. The piping work was accepted when the pressure did not fall below 40 psi. Correction was made for temperature changes.

Following the pressure test, the boiler was put into operation and water temperature was increased under manual control to about 140 deg. F. With the recirculating pump running and some valve throttling, the entire system was balanced until all returns showed a reasonably uniform temperature.

After having been balanced manually, the system was switched to automatic control and adjusted to insure maintenance of design temperatures throughout the pool.

The panel-heating system was designed by Thermo-Radiant Consultants. The general contractor was California Builders Co., Inc. and the heating work was done by Robert Bruen and Son. All firms are established in Oakland, Calif.

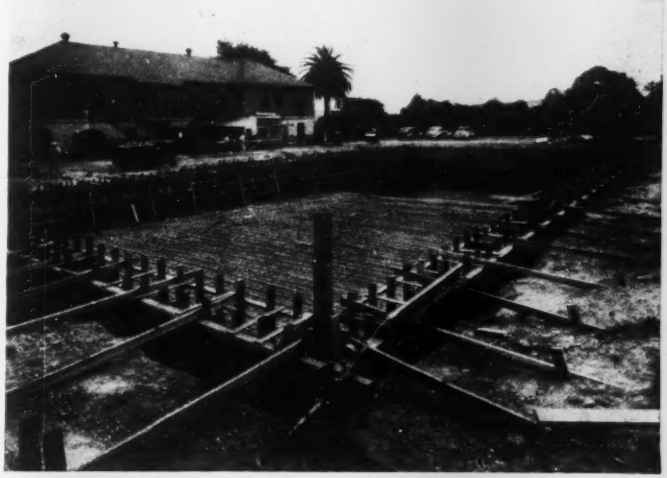


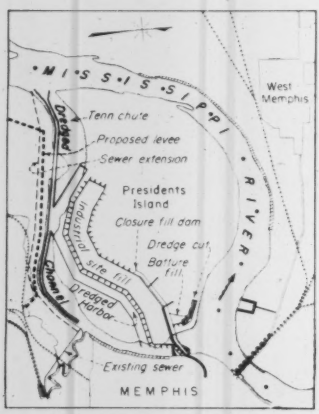
Fig. 3. COPPER TUBING WAS TESTED by hydrostatic pressure—after installation, but before concrete was poured—to insure minimum leakage.

Hydraulic Fill to Close River Reach For $17 Million Memphis Port

SOME TIME IN 1953—contingent upon the continuity of federal allotments of construction funds—the long-planned $17,000,000 Port of Memphis, (Tenn.) harbor is expected to be completed and placed in operation.

The completed facility not only will furnish an off-river harbor free from flood velocities, but it also will give Memphis an adequate barge-rail terminal and additional industrial area protected from floods.

Within ten years following completion of the project, waterborne commerce passing through the Port of Memphis is expected to be increased by 800,000 tons annually. This represents an estimated freight-rate saving of $1,400,000.



Preliminary construction has been in progress by the Corps of Engineers for nearly a year, leading to the eventual closing of the famed Tennessee Chute and confining all waters of the Mississippi to its present main channel on the north and west sides of Presidents Island. At present, about 7 percent of the mean low water flow passed through the chute.

After the chute has been closed at its upper end, it will be dredged to form the harbor, with a dredged channel outlet to the river at the lower end of the chute.

Industrial site of made fill

A huge industrial site, covering 960 acres and containing 48,000,000 cu. yd. of hydraulic fill, will be built up on Presidents Island paralleling the harbor. Trucks and rail access to the site will be across the closure fill at the head of the chute, leading to downtown Memphis.

Construction got underway in May 1948 and by the end of this June the following work is expected to be completed: (1) Installation of a willow fascine mattress 300 ft. wide by 2,700 ft. long at the head of President Island; (2) construction of a large "batture" embankment of dredged material forming an artificial foreshore for additional protection of the closure fill; (3) pumping of 750,000 cu. yd. of hydraulic material into the base of the closure fill; and (4) placing 1,000,000 cu. yd. of hydraulic fill in the upstream portion of the industrial site embankment.

Most of the work to date has been performed by leased dredge or government plant and hired labor. One contract, however, for the construction of 1,200 ft. of approach embankment on the east, or Memphis, side of the river, has been completed by McMullen, Larson and Co., Dallas, Tex., at a contract price at $65,000. This rolled-fill embankment, built to a top width of 100 ft., contains 96,000 cu. yd. of excavation. A 1,000-ft. hydraulic fill will connect this approach embankment with the east end of the closure fill.

FAMOUS TENNESSEE CHUTE in the Mississippi River (left background) will be closed at the north end to protect the new Port of Memphis Harbor, now under construction. Presidents Island (see map) will be connected to the mainland by a dam that will in effect convert the whole "chute" into harbor area. Dredging of new channels and the harbor proper will provide fill for new industrial building site.

First major operation was dredging a borrow pit 2,800 ft. long and extending 60 ft. below the 1947 low water reference plane, El. 184, to receive the willow mattress on its landslide sloping bank. This point (see accompanying map) will take the brunt of the river as it turns west and flows around Presidents Island.

All dredging in the pit—completed last September—was done by the 27-in. cutterhead dredge Cartagena, leased from the Standard Dredging Co., New York City. The material was pumped from 700 to 6,000 ft. under a 30-ft. lift, with an average discharge of 1,700 cu. yd. per pumping hour. Over 3,250,000 cu. yd. of material was pumped by the dredge into an area of 118 acres, which includes the batture embankment, the base of the closure fill, and the industrial site area.

Design plans called for the borrow pit to be dredged to a bottom width of 150 ft. The river side of the underwater excavation was permitted to seek its own slope, of about 1 on 3. The landside, however, was cut to a slope of 1 on 3½ to receive the willow mattress.

Dredged in three stages

The precision cutting of this bank, with the cutting-head working entirely under water, called for a high degree of skill in operating the dredge. This is how it was done—employing three stages of dredging.

During the first stage, which was started May 28, 1948, the head was lowered 48 ft. below the river elevation which was about 4 ft. above mean low water. One continuous cut was made from end to end of the area without changing the elevation of the cutter.

The cutter was kept 10 ft. back from the theoretical cut-bank line to keep from pulling down excess material. Upon completion of the first cut, about 15 ft. of backfill was left behind the dredge; giving 33-ft. net of initial cut. No attempts were made to clean the channel during the first pass of the dredge, since volume of excavation was the primary objective.

The same procedure was followed during the second stage, which was started Aug. 16. The head was dropped to 60 ft. below water. It was kept 10 ft. away from the final cut line. This cut left about 6 ft. of backfill behind the dredge. A 17-ft. rise in the river between the beginning of stage 1 and the completion of stage 2 washed in an estimated 250,000 cu. yd. of material that had to be removed.

All cleaning up was done during the third stage of dredging, which was begun Sept. 3 and completed in 15 days. Backfill was held to a maximum of 1 ft., as the final cut was made in three sweeps of the head, before stepping forward. This was where great skill was required in operating the dredge.

AN INDUSTRIAL AREA of 960 acres will be reclaimed with hydraulic fill dredged from Tennessee Chute to form the harbor and channel.

Making the final cut

One complete sweep was made across the bottom of the borrow pit, with the head set 60 ft. below low water. On the second sweep, the cutter was raised and swung into the bank with a coordinated swing to make the final bank-cut on the required slope of 1 on 3½. The top of this swing ended at a point about 20 ft. below low water.

Then the head was raised up to the water line, extended out to the required top of bank at that point, and brought down and in on a coordinated cut to 20 ft. below water. This completed the cutting of the underwater bank for the willow mattress. Final operation was to make two clean-up sweeps across the bottom of the borrow pit.

Installation of the fascine willow mattress followed completion of the borrow pit. It was started Oct. 1 and completed Dec. 31. River currents will soon fill up the borrow pit giving added protection to the mattress. Top of the mattress is 5 ft. above low water. The upper bank was graded with a barge-mounted dragline and will be riprapped. The dragline pulled its excavation down under water, for removal by the dredge.

In addition to the requirements for precision underwater cutting of the land bank of the borrow pit, an old stone-ballasted lumber mattress and a permeable pile dike extending across the area called for additional precautions in dredging.

Fitting the dredge to the job

An 82-in., four-vane impeller was used for the initial dredging by the Cartagena, using 3,500 ft. of 27-in. discharge line operating under a 25-ft. lift.

Upon reaching the old ballasted mattress, the impeller in the centrifugal pump on the dredge was changed to one having three vanes, 84-in. in dia. The discharge line was shortened to 2,000 ft. and the lift kept at 25 ft. More than 2,000 cu. yd. of old stone, up to 75-lb. size, were pumped through

WILLOW FASCINE MATTRESS for protection of Presidents Island was ballasted with stone almost to the point of sinking (top photo), then sunk by additional stone cast from barge moving slowly downstream over mat.

this line, in breaking through the old lumber mattress.

After the site was cleared of the submerged mattress and permeable dike, the four-vane, 82-in. impeller was reinstalled in the pump and the discharge line lengthened to 5,000 ft. Subsequently, a four-vane 84-in. impeller was substituted when the length of discharge line reached 5,500 ft., followed by a four-vane, 88-in. impeller for pumping 6,000 ft.

Despite the trouble caused by the old stone ballast, and time spent in back-washing, cleaning out tree stumps, adding pipe and changing impellers, the dredging crew got 100 percent pumping time during 91.5 percent of the total contract dredging time of 2,660 hr. This was exclusive of time lost during breakdowns, for which no payment was made.

Long closure fill needed

Major items of construction planned for the future development of this project include the driving of 2,550 timber piles in three rows, each 1,700 ft. long. One row will connect the upper end of the willow mattress to the upsteam slope of the closure fill. The other two will be driven a short distance downstream, perpendicular to the industrial site fill.

The 6,800-ft. closure fill at the head of Tennessee Chute, expected to be started this year, will contain 6,000,000 cu. yd. of hydraulic fill. It will be built to El. 245 above Mean Sea Level, with a 100-ft. top width and side slopes of 1 on 8. Slopes will be surfaced with 6 in. of asphalt, topped with sod on the upper 10 ft. of the upstream side and the upper 30 ft. on the downstream side. The closure fill is not designed as an earthen dam, in the normal meaning of the term, since the differential of water level above and below the closure fill will not exceed 3 ft.

The industrial site fill also will be made of dredged material, mostly from the harbor and ship channel extending down the chute. It will be about 21,000 ft. long with a top width of 2,000 ft., and side slopes of 1 on 6 and 1 on 8. Top of this embankment will be El. 240, requiring about 20 ft. of fill on Presidents Island.

The harbor will be dredged to a 900-ft. bottom width and to 30 ft. below low water. The approach channel will be 300 ft. wide by 12 ft. below low water.

City to operate harbor

Other major items in developing the Port of Memphis harbor include 11 miles of rolled-fill levee on the city's side of the river to protect a potential industrial area of 6,800 acres. One pumping station will be constructed for internal drainage of this area, and 27,000 ft. of 60-in. sewer to prevent existing sewers from discharging into Tennessee Chute.

Memphis is furnishing all right-of-way for the Port of Memphis project, and will install all operating facilities such as power lines, railroad trackage, access roads, docks and slips. The completed port will be a non-profit operation of the Memphis and Shelby County Harbor and Port Commission.

Men in charge

The entire project is under the immediate supervision of the Memphis District, Corps of Engineers. Col. Louis H. Foote is district engineer and Earl Houston, project engineer. Associated in the planning and development of the project were: G. W. Miller, executive assistant to the district engineer; J. W. Pumphrey, chief, Engineering Division; C. G. Hutton, chief Construction Division; and John K. Patterson, general superintendent of the dredging work. The project is under the over-all direction of Brig. Gen. Peter A. Feringa, president, Mississippi River Commission.

Insulated Stainless Steel Panels Inclose 4-Story Office Building

EXTERIOR WALLS of a four-story, air-conditioned office building under construction at the General Electric Co.'s Schenectady, N. Y., works are faced entirely with stainless steel. Selected to minimize maintenance, the stainless steel sheets form the outer surface of insulated, hollow steel panels that have a maximum thickness of 3 in.

This marks the first time use has been made of this metal in this fashion for a large building. It also signalizes continuation of the trend toward thinner walls and the use of panel construction.

Architectural treatment

Appropriately enough, the design of the office building harmonizes with that of an adjoining structure—a new turbine manufacturing plant, covering 20 acres of land—which is inclosed with insulated steel siding protected with aluminum paint. The offices occupy a 50x400-ft. area along one end of this factory.

Midway in the length of the 4-story building is the main entrance, framed by a steel canopy and glass-block panels. Vertical strips of windows are placed above the main entrance and above the side entrances near each end of the structure. Continuous strips of windows extend horizontally on both sides of the main entrance in each story.

The building has a structural steel frame, with columns spaced 20 ft. apart in the longitudinal direction. Channel girts are connected to the outer row of columns to support the steel wall panels.

The main wall panels are a 20-ga. fluted front sheet, 1½-in. of glass fiber insulation and a flat 18-ga. steel back sheet. They came to the job in sections 2 ft. wide and lengths varying from about 3 to 17 ft., convenient for one-piece installation between stories or between windows.

Uneven light reflection a problem

At the spandrels between the horizontal runs of windows, panels were first installed with a 20-ga. flat front sheet. However, due to the size of this panel, which is about 2 ft. wide by 5 ft. high, the perfectly flat surface desired was not obtained, because large depressions appeared in these sheets. Because of the high reflectivity of the stainless steel, the unevenness resulted in an unsightly appearance. To rectify this condition, an overlay front sheet, with outside moldings to act as stiffeners and to break up the light reflection on the relatively large areas, has been added.

Above the canopy at the center entrance and for the full height of the side entrances, 3-ft. wide, flat-faced vertical pilasters are formed of 18-ga. stainless steel sheets applied over the typical wall panels. No objectionable depressions occurred in the pilasters, because the 1-ft. wide sheets of which they are composed had flanged edges which stiffened the facing and enabled tight joints to be made.

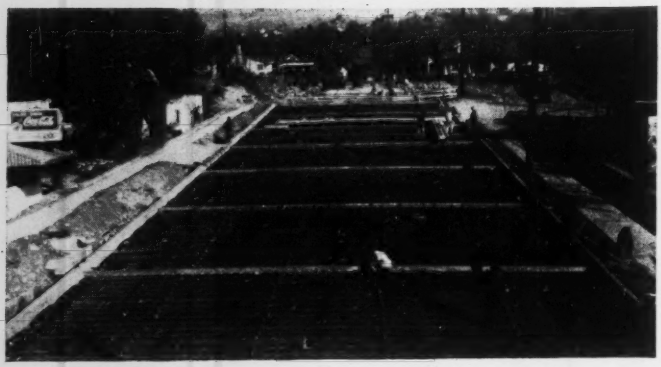
Under the canopy at the center entrance, 3-ft. square pilasters were constructed of 18-ga. stainless steel, backed up by a 16-ga. steel plate, supported by the structural steel framework. Here, too, it was considered advisable to provide vertical moldings for stiffness and to break up the large flat areas.

Protective paper sticks to facing

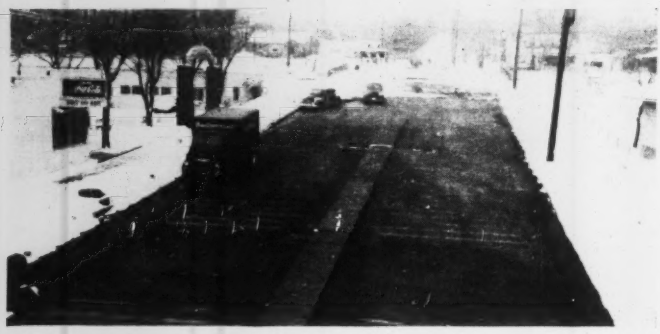
Another problem encountered during construction arose as a consequence of the method of fabrication of the typical wall panels. In forming the front sheets, it was found necessary to cover the exposed face with paper to preserve the finish during rolling operations.

Some of the papers and adhesives tried "balled up" during the rolling operations, making dents in the sheets. Considerable difficulty was encountered in obtaining the proper paper and adhesive, but finally satisfactory rolling of the fluted sheets was obtained with a 30-lb. or 40-lb. heavy building paper, with full-drying type paste as an adhesive. The paper was left on the steel sheets to protect the exposed surface during transit and erection. It was necessary to steam the paper off after the panels were erected.

Design and construction were carried out for the General Electric Realty Corp. by Stone & Webster Engineering Corp.



WARM-WEATHER WORK on installation of panel heating under pavement at a highway underpass in the Pacific Northwest makes . . .



COLD-WEATHER DRIVING EASIER by removing snow as fast as it falls, and preventing the formation of ice on steep highway grade, as . . .

Oregon Utilizes Hot Spring To Defrost Road Underpass

O. R. Kennen
Resident Bridge Engineer
Oregon State Highway Commission

TAKING ADVANTAGE of a situation not common to many areas—the presence of natural hot springs—the Oregon State Highway Commission is employing panel heating in a highway underpass to melt snow.

The installation is actually in two parts, on an underpass under the main line of the Southern Pacific Railroad in Klamath Falls, and on a bridge over an irrigation canal of the U. S. Bureau of Reclamation which parallels the railway line.

Difference in elevation of the underpass and the bridge necessitated a grade of 8 percent for a distance of 400 ft. Engineers decided that since this grade would be hazardous during the winter months, some provision should be made for clearing it of ice and snow.

Commission engineers designed and incorporated in their plans a grid system of ¾ in. wrought iron pipe, to be placed in the roadway deck of the four-lane concrete bridge, and in the underpass pavement. These pipes were to circulate an anti-freeze solution that had been heated by passing through a system of coils extending 300 ft. into a hot water well.

A 12 in. well was drilled to a depth of 420 ft., until an artesian flow of hot water at the rate of about 20 gal. per minute was encountered. Although this water had a temperature of 190 deg. F. at its greatest depth, an analysis showed that it contained a corrosive mineral which would hinder free circulation. It was therefore decided to circulate a mineral-free water, containing anti-freeze, in a closed system, using the well water for the heat source.

The heat exchanger installed consists of three 2-in. pipes extending 310 ft. into the well. Two of these pipes contain the solution returning from the grids, while the other contains the heated solution being pumped from the exchanger into the grids, so that twice as much solution is being heated as is being pumped out at any time.

A 2-in. header pipe runs from the well to the pavement, and parallel to the road for a distance of 420 ft.

Embedded in the pavement is 15,000 ft. of ¾ in. wrought iron pipe, made up into one grid for each series of fourteen 30-ft. road panels. Each of these fourteen panels is connected with the 2-in. header, and each panel is controlled by a valve near the junction of the header to insure an even flow of solution.

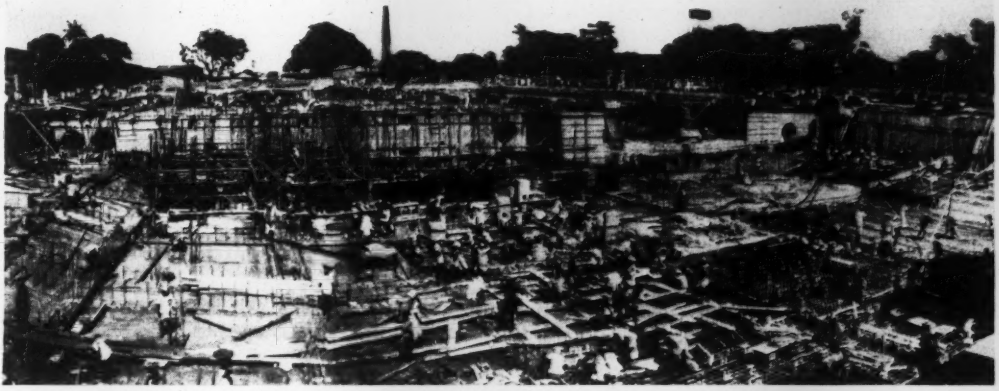
Whenever the water at the top of the well is above 145 deg. F., there is a natural artesian flow. However, as the solution from the grids cools the well water, this flow stops, and it is necessary to use a pump to remove the chilled water.

But, even without the aid of a pump, a week of sub-zero weather will lower the temperature of the water in the hot header to 37 deg. F., and the pavement would still remain above freezing.

With a 1-hp. pump running, solution leaves the heat exchanger at about 134 deg. F. and returns at 84 deg. F., while the chilled well water is pumped from the well at about 108 deg. F. Pavement temperature thus remains above 45 deg. F. under the most severe conditions.

Actually, a pavement temperature that would melt 1 in. of snow per hour would be adequate for the location, and since the temperatures in the pavement have ranged much higher, the surface becomes completely dry a few hours after a snowfall.

The circulator and pump are thermostatically controlled so that when air temperature drops and snow or freezing weather is approaching, the circulator automatically starts hot solution through the grids to warm the pavement in advance. In the well house assembly, thermometers are placed in the supply line, the return line, and in the well discharge line, and valves are installed in each of these three lines to facilitate repairs without necessitating draining the entire system.



A GREAT CELLULAR RAFT of reinforced concrete was built to carry the Cossipore power station on the deep clay at Calcutta.

Displacement Raft to Support Large Power Plant in India

(McGraw-Hill World News)

A NOTABLE application of the displacement theory to foundation design is found in the new power station of the Calcutta Electric Supply Corp. in Cossipore, a suburb of Calcutta in India. Because of unfavorable foundation conditions found at the site, the entire structure is carried on a cellular "raft" extending to a depth below the surface of the ground sufficient to result in the removal of so much earth that part of the load imposed by the power plant on the subsoil will be offset. This plan brings the remaining unit load to within the capacity of the subsoil to carry without undesirable settlement.

Largest station in India

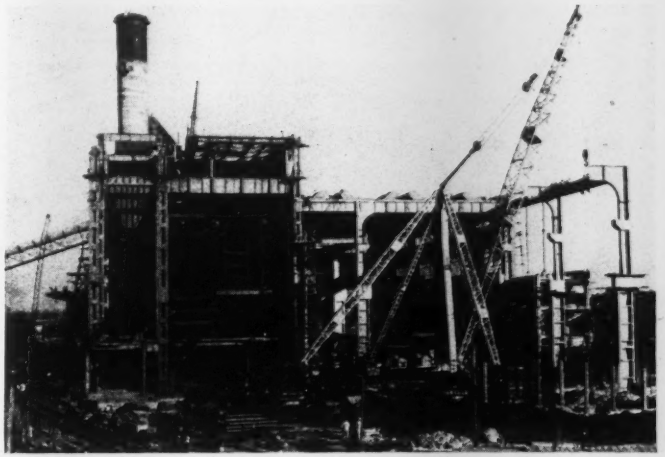
When completed, the Cossipore station will contain three 50,000-kw. and two 50,000-kw. steam-driven power generators, making it the largest and most efficient thermal station in India, if not in all of southeast Asia. It is being built in three stages to permit the earliest possible operation. Stage I includes the two 30,000-kw. units and one 50,000-kw. unit, all of which are expected to go to service late this year. Stage II will add a second 50,000-kw. unit early in 1951. The third stage will be started at some future date.

A model of the cellular-type foundation raft built for Stage I is shown in an accompanying illustration. It will carry both the power station superstructure and the administration building. A second section to support the structures required for Stage II also has been built.

Poor foundation conditions

Borings made at site showed the ground to consist of clays and clay-silts of poor bearing quality, harder and softer layers alternating and extending down to great depth.

To meet plant requirements, it was necessary to provide a turbine basement 12 ft. 6 in. below ground level and also to provide for accommodation of the circulating water mains and other services within the foundation. This led in any case to founding at a depth of 17 ft. below existing ground level over much of the area.



THE STRUCTURAL FRAME of the power station is of steel, designed to resist earthquake forces. Walls are to be of brick, and floors and roof of reinforced concrete.

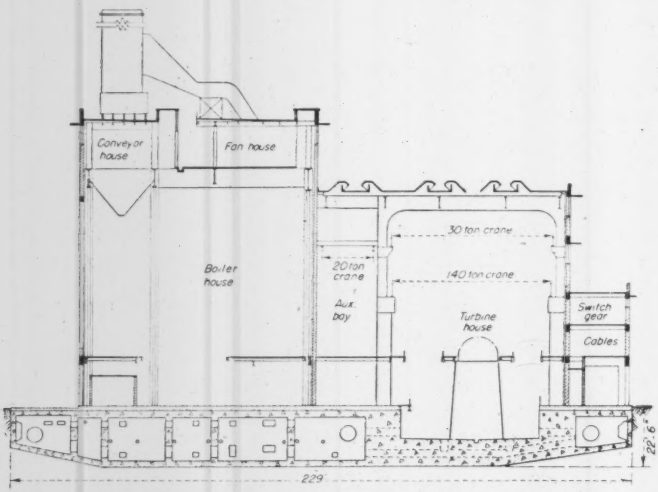
Piles were considered but the foundation was very large in relation to any practical or economic length for friction piles, and general settlement would have been unavoidable. Since the site is in a seismic area, the comparatively low earthquake resistance of piles presented an additional difficulty.

It was calculated that by going to a depth of 21 ft. (only 4 ft. greater than imposed by non-civil engineering conditions) and using cellular construction sufficient displacement could be obtained to reduce the gross bearing pressure of 1¼ tons per sq.ft. Soil tests showed that with the latter value, settlements, although appreciable, would not be objectionable. It was decided, therefore, that a cellular buoyancy-type raft should be adopted.

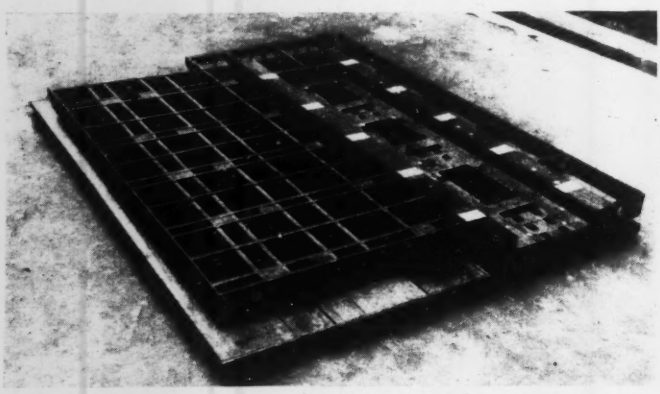
The over-all dimensions of the raft are: width 229 ft., depth 20 ft. 9 in. exclusive of 1 ft. 9 in. topping. The over-all length of Stage I and Stage II as now constructed is approximately 450 ft. Stage III will provide an additional 150 ft.

The purpose of the topping is to provide accommodation for pipes, cables and other necessary services, full details of which were not available at the time the main foundation was planned. This made it possible to go ahead with design and construction of the raft without waiting for the pipe and cable layouts to be completed.

The topping is of cellular construction filled with aggregate. Longitudinal and transverse concrete ribs 9-in. thick and on 8-ft. centers except at machine foundations and at cableways were poured on top of the raft deck to form cells 1 ft. 4 in. deep that later were filled with rammed hard-core aggregates to the level of the top of the ribs. Then a 5-in. concrete slab was poured over the entire area to form the floor of the power house.



CROSS-SECTION through the power house showing the positions of the major elements with respect to the supporting raft of cellular reinforced concrete.



MODEL OF THE FOUNDATION RAFT that was used in the design studies. This shows the raft that was built for Stage I, which provided space for two 30,000-kw. units and one 50,000-kw. unit.

Cellular-type raft foundation

Investigation showed that a cellular-type raft of considerable depth afforded the best practicable method of keeping loads on the soil down to the prescribed limits, and at the same time providing a means of obtaining the necessary stiffness and strength in bending and shear to spread concentrations of surface loadings over large areas without appreciable flexing and distortion. Its hollow recesses are used for accommodating the 6-ft. diameter circulating water mains, and numerous other mains and cables required for operation.

The raft has been proportioned in plan so as to provide a center of resistance distant only a few inches from the center of gravity of its superimposed loading, thus reducing to a minimum any tendency to tilt after completion. The construction needed careful timing to insure that at all stages of work the foundation would be hydrostatically stable and undamaged under varying ground water conditions.

Underlying clay rises

Tests were made during excavation to determine the rise of the clay at founding level, and this varied from approximately 1 in. to 3 in. depending largely on the speed at which the various sections of the work were excavated and the rate at which the load produced by the structure could be reimposed to prevent further ground swelling.

Records of the settlement, related to the level of the founding material prior to excavation, are being maintained continuously. The settlements have corresponded generally to the loadings imposed by the superstructure and plant as it was erected. The level of the bottom of the Stage I foundation has only recently reached a level corresponding to that of the founding material prior to excavation.

Only small quantities of water had to be pumped out during excavation, which took place during the dry

period. Due to lack of excavating machinery, the excavation was a major problem. It involved the removal of some 70,000 cu.yd. of soil from the site for Stages I and II of the raft, and the excavation proper was entirely by manual labor.

Work on the construction of the excavation commenced in 1945 and foundation work for Stages I and II was essentially completed by November 1946. Stage I will go into service this year.

The boiler house and turbine house are provided with structural steel framework with brick walls and reinforced concrete floors and roof. The administration building, ash plant house, and the transformer annex have reinforced concrete frames with brick panel walls.

The consulting engineers for the whole project are Merz and McLellan of London, who supplied the data and photographs for this report to the Bombay representative of McGraw-Hill World News. Rendel, Palmer & Tritton, also of London, designed the raft and other reinforced concrete portions of the work on behalf of Merz & McLellan. The main contractors for the civil engineering work is the Hindustan Construction Co. Ltd., Bombay.

Author's Closing Comment on . . . . . .

A New Approach to Pavement Design

F. N. Hveem
Staff Materials and Research Engineer
California Division of Highways
Sacramento, Calif.

Editors Note: An article by F. N. Hveem entitled "A New Approach to Pavement Design" was published in the July 8, 1948, issue of Engineering News-Record, p. 134, and a discussion of that article by five authorities on flexible-pavement design was published in the Dec. 23 issue, p. 60. The following is Mr. Hveem's comment on that discussion.

Both Jacob Feld and K. B. Woods in their comment on my article on pavement design have pointed out the important effects of frost action and the question of considering annual rainfall distribution.

There can be, of course, no argument about the necessity for considering frost action and it may well be that this consideration becomes a predominant one; however, this phase was not discussed for two reasons: First, severe frost action is confined to only limited areas in California and therefore the background available is not considered sufficient to warrant expressing opinions on this aspect of highway construction. Second, it is believed that it should not be necessary to make arbitrary allowances for climatic conditions provided that it is possible by investigation, to determine the appropriate soil condition.

This statement applies to the practice followed in many areas of including a factor in design formulas which varies according to the local rainfall. In the opinion of the writer, this adjustment can be made more consistently and more logically by developing a test specimen which is either wet or dry or at some intermediate state, depending upon the conditions which will surround the proposed project. In other words, it is necessary for the engineer to know in advance whether it is appropriate to test the soils in a state of high compaction or in a relatively loose condition and whether or not the soils will ultimately become saturated. This means that if the soil specimen when tested has the degree of density or lack of it and contains the amount of moisture corresponding to the worst conditions expected, it would then seem to be unnecessary to make any allowances for either rainfall or frost action.

Effect of underlying soils

I have no disagreement with Mr. Woods on the contention that there are many variables, particularly in the soil profile itself; however, it seems to be a rather general practice in highway construction to develop at least low fills requiring compaction and consolidation during construction so that in the majority of cases we are not dealing directly with the undisturbed soil in computing the necessary thickness of base and pavement layers required. It is for this reason that the term "basement soil" has been proposed to indicate the lowest level of the roadway structure, which in the majority of cases will be a soil layer that has been moved or disturbed and recompacted. If the layers of subbase, base and surface are to be placed directly upon undisturbed soil horizons in place, it is easy to see that the problem of testing and evaluating the variable conditions represented by the undisturbed soil could become quite exacting.

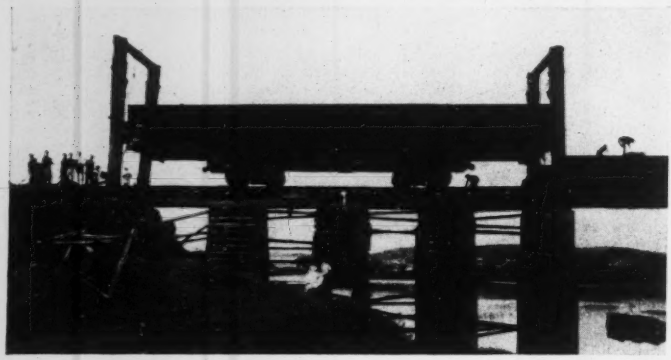
V. A. Endersby is correct in his assumption that the constants used to evaluate traffic are arbitrary and a more detailed analysis indicates that the relationship between loads of various magnitudes cannot be calculated by a simple constant applied to the number of loads in each category. In other words, the destructive effect of heavy loads does not bear a constant relationship to the destructive effect of the standard 5,000-lb. wheel load.

Determination of pavement thickness

Mr. Endersby asks whether the nomograph could not be extended to cover pavement thickness. The determination of pavement thickness is readily accomplished by means of the chart simply by assigning a resistance value to the base material and then computing the thickness of bituminous surface required. However, as a practical matter, the thickness of bituminous surface layers is more properly estimated from other considerations. In other words, it is a legitimate procedure to select the thickness of the pavement based upon practical construction considerations such as the degree of smoothness desired, assurance that the minimum thickness desired will not be reduced in local areas and then work backward through the chart to indicate the quality and thickness of base and subbase required to bridge the gap between the quality of the basement soil and the expected effect of traffic loads.

L. E. McCarty comments upon the absence of any statement as to a definite value for one of the principal stresses in which the resistance value is to be measured. We adopted a load amounting to 160 lb per sq. in. but have no reason to believe that this is a particularly critical matter and have found no evidence of marked variation in the ratio within a range of 100 to 400 lb. per sq. in. The use of the fifth root of the cohesiometer value is based entirely upon empirical data and no theoretical reason for this particular value has been developed.

FIELD AND OFFICE



LOADING A 30-YEAR-OLD BRIDGE on a flat car, during a quick-change Chinese operation, engineers make a girder replacement job look simple.

Quick Bridge Replacement on a Chinese Railroad

Four old plate girder spans near Canton Hankow (China) Railroad were replaced recently by a method involving portal frames, temporary-track falsework and two flat cars.

These replacements were part of the railroad's program of rehabilitating 200 spans. The program was carried out largely by hand methods, with assembly at the sites, but here, not far from the railroad's headquarters, shop-fabricated 45-ton through plate girder spans 64 ft. long, 17½ ft. wide and 5½ ft. deep were set on existing piers and abutments.

Replacement steps were as follows:

1. Guyed timber portal frames erected over span ends.
2. Falsework cribs built under span.
3. Old span raised by five-part block-and-tackles on portals.
4. Temporary track on timber cribs.
5. Flat car run under span; span lowered and hauled to side track.
6. New span run in and picked up by rope falls.
7. Flat car removed, temporary track removed, new through plate girder lowered to its seats.

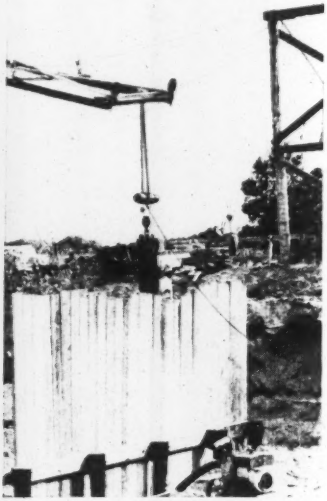
Best time for a span-switch was 5 hours.—W. K. Lee, Supervisor of Fifth Bridge Erection Gang, Canton Hankow Railroad.

Positioning a Pile Hammer With Electric Hoists

Electric hoists were adapted to sheet-pile driving on two erosion-control dams recently built on a creek in Denver. Temporary suspension uprights 30 ft. high, (one partly shown below) were erected 120 ft. apart on the stream banks, and one of two parallel suspension wire ropes was aligned over the sheet-pile location. The wire ropes carried a rectangular carriage from which hung an electric hoist that handled the piling and a double-acting steam hammer. The hoist was held in its horizontal position by two strap-iron struts. All carriage pulleys were idlers. Power for carriage travel came by separate cable from a second electric hoist mounted on the suspension tower nearest the work. A trailer-mounted 5-kw. generating set furnished the electric current. Gage Odell, of Denver, was the contractor for this project.

TRAVELING HANGING SCAFFOLD

MOUNTED ON RUGGED CASTERS and heavily counterweighted, this cantilevered I-beam assembly carried its hanging scaffold at fixed level on a cornice removal job in Los Angeles. I-beams were held in position by a framework of regular tubular-scaffolding elements. Pozzo Contracting Co. Ltd., Los Angeles, performed this work for the Santa Fe Railway.



SUSPENDED ELECTRIC HOIST handles sheet pile job. Note electric power and control cable hanging from hoist.

READER COMMENT

Rigid Codes Blamed on Labor

Sir: The present nation-wide situation of outmoded and obsolete building codes that have not kept pace with new developments in design and materials is one of the principal factors responsible for high costs in building construction.

A contributing factor to high costs is the attitude of some of the building trades in resisting amendments to building codes, even though approved by the superior judgment of qualified experts. A case in point was cited in the NEW YORK TIMES, Feb. 13, by Leonard Frank, president of Long Island Builders' Institute.

"Only last year, at the request of Mayor O'Dwyer, and approved by the building department superintendents in Brooklyn and Queens, a proposal was made to reduce the thickness of brick walls in multifamily houses occupied by no more than four families and no more than 20 ft. in height. This reduction of from 12 to 8 in. would have represented a desirable reduction in cost, and had been certified as structurally sound by architects and engineers. But the proposal was killed in City Council Committee after the bricklayers had strongly opposed, although no opposition was voiced by other trades, nor the Building Trades Council."

There is an unfortunate implication here. When matters concerning economies that will materially reduce high costs without detriment to the safety or use of the structure are decided from a political viewpoint rather than the professional or technical viewpoint of qualified designers or construction men, it is high time to remedy this condition detrimental to the public welfare.

ERIC FLEMING
Architect and Engineer
New Brunswick, N. J.

Construction Economics

Sir: Since R. D. Sannit's article on "Do Our Estimates Cost Too Much" has focused the "spotlight" on professional surveys as the means of eliminating wasteful estimating, it is fitting to mention the prevailing waste in design and construction which could be avoided by following the right procedure. Even though construction costs are now higher than ever, due to inflation in the price of everything, practically no effort is made toward more economy in construction design and the administration of bids and contracts.

It seems that the higher and more wasteful costs are, the more carelessly they are passed on to the consumer, so that gradually the industry is pricing itself out of the market through reckless inflationary business management. Plans and specifications are prepared with numerous and needless alternates, or revised several times because the designer does not have knowledge of the current material and labor cost incorporated within the structure wholly or in part. In many instances, two complete sets of plans are prepared in advance, in the event that bids run too high. Drafting costs are also high. Other projects are spread all over the landscape without consideration of cost or utility.

The wasteful duplication in estimating is negligible as compared with the waste in design and the uneconomic system of bidding and awarding contracts by lump sum, cost plus or upset fee basis. The methods used practically abolish the benefit of competition because neither the cost of proposed structure, nor the basis of bidding are pre-established scientifically.

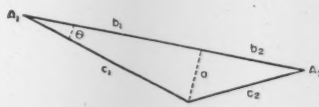
The use of a professional preliminary assay or estimate for controlling the design, and a quantity analysis as a purchase requisition for the basis of bids and contracts, would eliminate waste and reduce construction costs at least 25 percent. But, who cares today about waste, even though there is a depression brewing for tomorrow? The slogan is "Today we live, tomorrow we die." The only way to maintain prosperity is through more production by eliminating waste and increasing efficiency of output.

G. SZMAK
Executive Secretary
Construction Surveyors Institute
101 Park Avenue, New York 17, N. Y.

Slope Taping Method

Sir: I read with interest the article in your Feb. 3 issue (p. 76) by Mr. Justus A. Villa on slope-taping. The method can, of course, be used to solve any triangle when two sides and an angle opposite one of them are given, provided that the angle is small.

The writer has developed a formula for the same purpose which does not require the use of versed sine or cosine tables and is not confined to small angles. By use of a 10-inch log-log slide rule, one can obtain a "correction" exact to 1 in 5000 or better for angles much larger than 4½ deg.



The method is based upon the algebraic expression: $c^2 - b^2 = a^2$ for a right triangle. Factored, this yields $c - b = \frac{a^2}{c + b}$. In the triangle a b_1 c_1, $a = c_1 \sin \theta$, which is obtained directly on the D-scale, by multiplication. Then

$$c_1 - b_1 = \frac{(c_1 \sin \theta)^2}{c_1 + b_1},$$

also,

$$c_2 - b_2 = \frac{(c_1 \sin \theta)^2}{c_2 + b_2}.$$

Now $a^2 (= c_1 \sin \theta)^2$ is found on scale A directly above the product $(c_1 \sin \theta)$ on D. For a tentative correction one divides $(c_1 \sin \theta)^2$ by $2c_1$. When this correction is obtained, it is subtracted from $2c_1$ to give a more nearly correct value for $c_1 + b_1$, and a second division is made using this corrected value. This process can be repeated a second time, though it is rarely necessary with vertical angles normally encountered.

The second quotient (or the third) is the correction sought for triangle a b_1 c_1. In like manner the correction for triangle a b_2 c_2 is found. All the time the hairline is left at the setting $(c_1 \sin \theta)^2$, only the slide being moved to the corrected divisor. The distance sought, A_1 A_2 is, of course, $c_1 + c_2$ minus the sum of the corrections, already computed.

R. T. BROWN
Assoc. Prof. of C.E.
University of Tennessee
Knoxville, Tenn.

Correction

Sir: In my article—"Horizontal Truss Designed to Clear Large Floor Openings" (ENR March 3, p. 61)—there are two errors.

In Fig. 2, the right-hand lower chord stress should be P/8, instead of 1 7/8 P as shown.

In the last paragraph, the second line should read "panel point is shown in Fig. 3."

OTTO EBEL
Designer, Consolidated Edison Co.
New York, N. Y.

BOOK REVIEWS

Sewage Works Financing

NOTES ON SEWER SERVICE CHARGES—By Henry W. Taylor, distributed by the American Public Works Association, New York-New Jersey Chapter, I. J. Casey, Jr., Town Engineer, Irvington, N. J., president. 27 pp. Mimeographed, 50c.

This is a discussion of sewer-service charges in the New York metropolitan area. Mr. Taylor's chief point is that service charges must be based not only on use of sewers but also on "readiness to use" and compares this latter factor with the fire-protection charge used in water rates.

Mr. Taylor's discussion lists certain formulas to determine an equitable charge for industrial wastes and tabulates sewer-service charges in use throughout the New York area. In unorganized areas, this discussion may provide a guide for establishing rate schedules for sewer service.

Route Surveying Manual

FIELD ENGINEERING — 22nd Edition (Searles and Ives)—By Philip Kissam. 422 pp. John Wiley and Sons, New York. $6.50, or $3.75 apiece for separate volumes: text and tables, respectively.

In this 22nd edition of the famous route surveying manual first written in 1880 by the late Messrs. W. H. Searles and H. C. Ives, Philip Kissam takes over as author. He had contributed one chapter to the previous edition; now he has rewritten many passages, added 40 new illustrations, prefixed a new introductory chapter, and deleted paragraphs on elementary surveying. New material includes the two-base method of precise altimetry, a discussion of photogrammetry and several curve and turnout surveying methods.

Prize Papers on Welding

DESIGN FOR WELDING—Edited by Robert S. Green, assisted by Douglas C. Williams and Charles B. Smith. 1,024 pp. The James F. Lincoln Arc Welding Foundation, Cleveland 1, Ohio. $2 in U. S., $2.50 elsewhere.

The book is composed of abstracts of 82 award papers from the recent "Design for Progress" program of the James F. Lincoln Arc Welding Foundation. Divided into sections on uses in the aircraft, automotive, railroad, watercraft, containers, furniture, machinery, welderies and structural fields, the papers describe the use of welding to reduce manufacturing costs, as well as to improve quality and performance. Sixteen papers are presented in the 222-page section on structures, covering such construction as bridges, outdoor substations, drilling masts, piers and structural frames for houses.

Miscellaneous Notes on Booklets and Reprints

A 1948 CEMENT AND CONCRETE REFERENCE BOOK has been published by the Portland Cement Association, 33 West Grand Ave., Chicago 10, Ill. The 87-page pamphlet contains facts concerning the history, manufacture and uses of portland cement and concrete. In a section on structural uses, different methods of concrete house construction are discussed, tilt-up wall construction is described, the development of reinforced concrete traced and the role of concrete in conserving the country's natural resources outlined.

SOME TIPS on design and construction techniques that can reduce maintenance on future public housing projects are given in a 28-page mimeographed pamphlet, "Maintenance Men Look at Housing Design." Obtainable for $1 from the National Association of Housing Officials, 1313 East 60th St., Chicago 37, Ill., it offers suggestions for site selection and development, foundations, walls, floors, roofs, heating, plumbing, electrical systems, painting, dwelling equipment and centralized maintenance facilities.

TO FACILITATE DISCUSSION of the best means for effectively resisting the forces that must be resisted by rock-fill dikes, the Beach Erosion Board is publishing in the January issue of its BULLETIN a translation of the paper containing the Iribarren formula for calculating the sizes of stone and related slopes of riprap structures for resisting wave action. Copies can be obtained from the President, Beach Erosion Board, Corps of Engineers, 5201 Little Falls Road, N.W., Washington 16, D. C.

METHODS FOR PRODUCING LIGHTWEIGHT AGGREGATES are presented in a 121-page publication, Report of Investigations 4401, "Production of Lightweight Concrete Aggregates from Clays, Shales, Slates and Other Materials," prepared by the Bureau of Mines. The bureau classified materials as to their bloating or expanding characteristics—necessary to the production of aggregates. Studies were made of the causes of bloating and bloating agents were added in various ways. The best products, the investigators report, resembled a foam and not a sponge, and the strongest foamed products were those with the smallest sealed-in bubbles of gas. The booklet may be obtained free from the Bureau of Mines, Publications Distribution Section, 4800 Forbes St., Pittsburgh 13, Pa.

PLUMBING AND PUBLIC HEALTH—A Bibliography, in an up-to-date list of articles, pamphlets and monographs dealing with the relation of piping and plumbing fixtures to health protection. A limited number of copies are available for distribution. The bibliography may be obtained by writing to Public Health Service, Federal Security Agency, Washington, D. C.

New Engineering Books

ENGINEERING THE NEW AGE—By John J. O'Neill. 320 pp. Ives Washburn, Inc., New York 19. $3.50.

NUMERICAL METHODS OF ANALYSIS IN ENGINEERING—Arranged and Edited by L. E. Grinter. 207 pp. The MacMillan Co., New York 11. $5.80.

PATENT LAW—Second Edition—By Chester H. Biesterfeld. 267 pp. John Wiley & Sons, New York; Chapman & Hall, London. $4.

THEORY OF MODERN STEEL STRUCTURES: Vol. II: Statistically Indeterminate Structures and Space Frames—Revised Edition. By Linton E. Grinter. 312 pp. The MacMillan Co., New York 11. $5.25.

ELEMENTS OF MECHANICAL VIBRATION—Second Edition. By C. R. Freberg and Emory N. Kemler. 227 pp. John Wiley & Sons, New York 16; Chapman & Hall, London. $3.75.

UNIFORM BUILDING CODE—1949 Edition—By Pacific Coast Building Officials Conference. 304 pp. Pacific Coast Building Officials Conference, 124 West Fourth St., Los Angeles, Calif. $3.25 (Short Form, $1.50).

ENGINEERING LAMINATES—By Albert G. H. Dietz. 797 pp. John Wiley & Sons, New York; Chapman & Hall, London. $10.

NEW DIRECTIONS IN SCIENCE TEACHING—By A. D. Laton and S. R. Powers. 164 pp. McGraw-Hill Book Co., New York and London. $2.50.

(*Continued on page 122*)

The Election of November 2, 1948 GAVE NO MANDATE FOR SOCIALISM

The President and those who support his legislative program have objected to the substance of my previous editorial, which appeared under this headline: "Now is the Time to FIGHT SOCIALISM in Washington."

In that editorial I explained how Washington is poised to follow the disastrous policy of forcing industry to skimp on new plants and new equipment. That policy landed Britain in the numbing embrace of the Socialists. I cited the experience of Britain to show how such skimping on industrial tools can bring a nation to economic stagnation . . . and Socialism.

The President, in his recent Jackson Day speech, brushed aside this warning . . . "They are again trying to frighten the people with the old worn-out bugaboo that Socialism is taking over in Washington." Senator Francis J. Myers of Pennsylvania asserted that I was guilty of "warfare against any reasonable effort to keep our system of free enterprise working."

These criticisms may be sincere. But they are not well-founded.

I want to show why they are not well-founded by basing this editorial on Washington rather than Britain.

In Washington the Administration has proposed a legislative program, the key parts of which would clearly put the country far on the road to Socialism. Let us see how.

There are two steps in the process:

FIRST: The government by its taxation program undermines private industry so that it cannot provide itself with the necessary new plant and tools.

SECOND: The government itself steps in to provide the plants and equipment that it has blocked industry from getting. *That is Socialism.*

Here is how Washington is promoting Socialization of the steel industry—and of other industries.

Steel has been expanding its capacity and improving its equipment chiefly by plowing back its profits. During the last three years it has spent $1.4 billion for new plants and new tools. That was more than the companies had available from their own earnings. But profits provided more

continued on next page

than half of that money—more than $700 million. The remainder came from loans and from depreciation reserves set aside out of the earnings to replace worn-out equipment.

Profits must continue to provide the funds needed to pay for the bulk of the steel industry's necessary expansion. That is because private citizens, their income slashed by heavy taxes, have not been willing to buy steel stocks even at prices ruinously low for the companies and their present stockholders. The stock market currently prices the mills and other facilities of the nation's principal steel-producing companies at far less than fifty percent of the cost of reproducing them.

Let us take another example. Profits are essential to expansion in the electric light and power industry also. This year private companies are planning to buy $2 billion worth of new plant and equipment. To do that without going overboard in debt, they must sell to the public some $300 million worth of common stock. A squeeze on their profits would make that sale virtually impossible.

For tens of thousands of small business enterprises profits afford virtually the only practical source of funds for new equipment and expansion.

In the face of these and many other examples that might be cited, what is the most effective way to prevent industry from re-equipping itself and expanding is capacity to meet our essential needs?

Obviously, it is to cut down profits. And that is what the Administration is trying to do. The President has declared that steel prices are too high, and is demanding that Congress raise taxes sharply on all corporations.

There you have the first step toward socializing industry.

Next comes step two. Have the government supply the tools and equipment which, by taxation, it prevents industry from getting.

The Administration has proposed legislation to carry out this second step. It is called the "Economic Stability Act of 1949," for short, the "Spence Bill."

This bill gives the President the power to provide industrial facilities—in steel, power or any other industry—where he finds that a shortage is hampering or is likely to hamper the economy.

True, the bill says that the government is not to construct new plants if private companies will do it through government loans, on terms prescribed by the President. That may be just one step short of complete socialization. But it is only a short step. And the Spence Bill authorizes the government to take that step.

By itself, the Administration's "Stability Act" sounds harmless enough. It would have the government build plants only as a last resort. But it provides also that if private enterprise cannot turn out all the goods the country needs, the government can and should step in and provide the equipment to do it.

Now, take that power together with an Administration tax program that undercuts the ability of private enterprise to supply the new plants and equipment it needs out of its own earnings. That combination promotes government ownership and operation of industry.

And that is Socialism.

The American people, of course, have the right to live under any system they choose—Capitalism, Socialism, Fascism, Communism, or what-have-you. But before Socialism or any other "ism" is imposed upon us from above, the people should know the facts. If this editorial shall have contributed in some small degree to that end it will have served its purpose.

The election of November 2, 1948 gave no mandate for Socialism.

President, McGraw-Hill Publishing Company, Inc.

OUTSTANDING ADVANTAGES OF RAYMOND CONCRETE PILES

Raymond's successful experience for more than a half century has thoroughly proved these six outstanding advantages of Raymond Concrete Piles. These benefits, plus Raymond's expert personnel and specialized equipment, result in sound, dependable substructures that meet every requirement. You are invited to consult our engineers for the facts.

1 **PERMANENCY**

Every Raymond Concrete Pile is a permanent achievement, accomplished by a series of carefully planned steps which assure a safe foundation support.

2 **GREATER CARRYING CAPACITY**

The use of rugged equipment and heavy hammers permits driving to high carrying capacities, and the soil pressures developed during driving are fully maintained.

3 **UNIFORM BEARING CAPACITY**

Regardless of variations in subsoil conditions, Raymond piles can be driven to any depth required to obtain uniform bearing capacity for the whole foundation.

4 **ENGINEERED FOR THE JOB**

Raymond can provide the type of pile specifically adapted for your job.

5 **SAVING IN CONSTRUCTION COST**

Raymond's long experience on all kinds of jobs, the ready availability of equipment and the relatively shorter lengths of Raymond piles compared to some types, assure position economy in foundation costs.

6 **COMPLETE SATISFACTION**

By the satisfactory completion of over 14,000 contracts, involving more than 50 million feet of piling, Raymond has established a world-wide record of achievement.

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Branch Offices in Principal Cities of United States and Latin America

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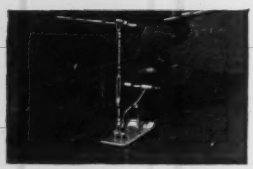
AROUND THE WORLD
52 YEARS FOUNDED 1897 OF PROGRESS

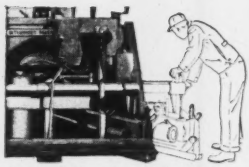
THE SCOPE OF RAYMOND'S ACTIVITIES

Includes every recognized type of pile foundation—concrete, composite, precast, steel, pipe and wood. Also caissons, underpinning, construction involving shore protection, shipbuilding facilities, harbor and river improvements and borings for soil investigation.

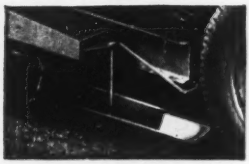
the Paver of the future - Jaeger's BP-5



1. AUTOMATIC MATCHING of any adjacent course, curb, gutter or other grade line.

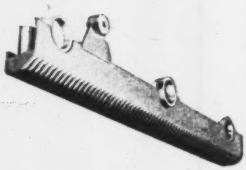


2. TWIRL A WHEEL TO CHANGE WIDTH: Lays any width 5'8" to 12'6", without adding parts.

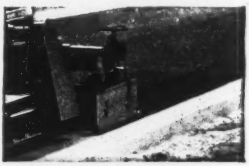


3. SMOOTHEST RIDING SURFACES: 12' longitudinal floating runners equalize screed level.

4. NO PREMATURE SEALING: Weight and traction are on the hard subgrade or completed course —never on the newly-laid surface.



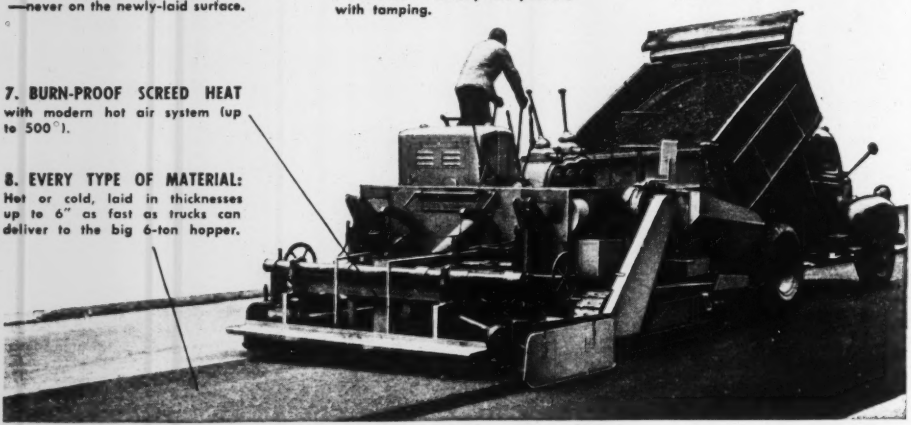
5. MORE UNIFORM MAT: Fast-oscillating, bevel-toothed screeds, tiltable as needed, work material to a uniform density not possible with tamping.



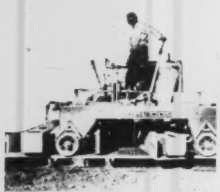
6. LAYS FLUSH TO CURBS and blends perfect-sealing joints between lanes.

7. BURN-PROOF SCREED HEAT with modern hot air system (up to 500°).

8. EVERY TYPE OF MATERIAL: Hot or cold, laid in thicknesses up to 6" as fast as trucks can deliver to the big 6-ton hopper.



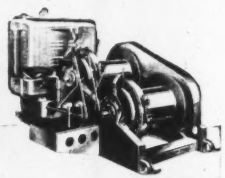
To the basically correct principles of paver design long-proved in earlier model Jaeger pavers, the Model BP-5 adds many important improvements in automatic precision and adaptability to the varied materials and conditions encountered in road, street and airport work. For complete information, see your Jaeger distributor or send for Catalog BP-9, describing numerous advantages of interest to contractors and highway engineers. Early deliveries will be limited to orders already on hand.



Diagonal Screed Finishers

Remixing, Compacting Spreaders

Mobile Truck Pavers



2 Speed, All-Steel Hydro-Hoists

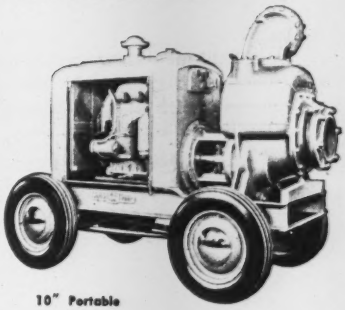
JAEGER "Sure Prime" for all pumping jobs

No other pump is built to handle water like the Jaeger "Sure Prime". Two separate, simultaneous priming actions prime it faster and more surely. Extra power in its engine, an ever-tight seal, and water passages 6 times larger than the intake insure the vacuum, capacity and pressure to pump big volume, against higher heads, move water at the lowest known cost per gallon to drain or supply your job.

Overall enclosures, exclusive with Jaeger, insure a dry, quick-starting, smooth running engine in all weather. Close-grained shell castings *armored against wear*, long-life Lubri-Seal always accessible for inspection, adjustable hardened impellers and replaceable liner plates mean thousands of extra hours of service for your money.

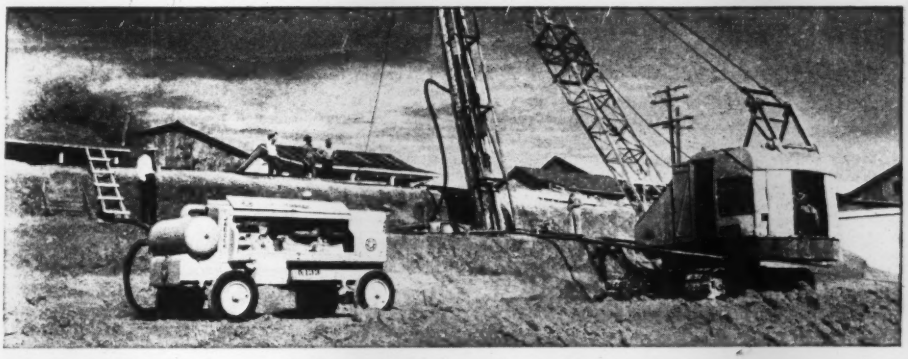
1½" Bantam

1½" to 10" sizes — capacities 3000 to 240,000 gph for dewatering service. Also pressure pumps including Super-Jet pumps for up to 275 lbs. pressure.



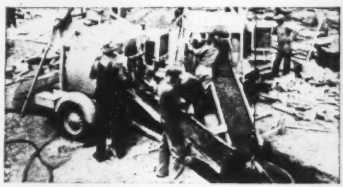
10" Portable

"Air Plus" pressure does 4 days' work in 3



Jaeger "new standard" compressors, delivering 15% to 20% more air than old standard ratings set in 1932, operate today's air tools at full pressure (90 lbs. instead of 70 lbs. at the tool), develop their full hitting power and drilling speed, actually do 30% to 40% more work per day.

This 15,000 lb. pile hammer, for example, requires 565 cfm of air at 100 lbs. for top efficiency and gets it from a Jaeger Model 600. Two big wagon drills will drill 30% to 40% more footage with this Model 600 than with any 500 ft. compressor. Other sizes, 75 ft. for one heavy paving breaker, 125 ft. for two breakers, 185 ft. for three, 250 and 365 ft. for larger tools, offer you comparable advantages.



Concrete, Bituminous Mixers

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engineered equipment

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THE JAEGER MACHINE COMPANY

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The PROBLEM — How to move a mountain of rock quickly and at low cost with a minimum of maintenance shutdowns.

The SOLUTION — A MARION 151-M, 6 cubic yard shovel, designed for continuous service in rock.

The MARION 151-M is the shovel FOR YOU!

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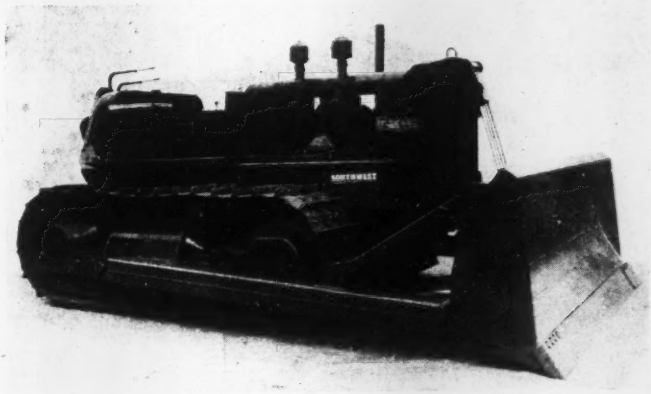
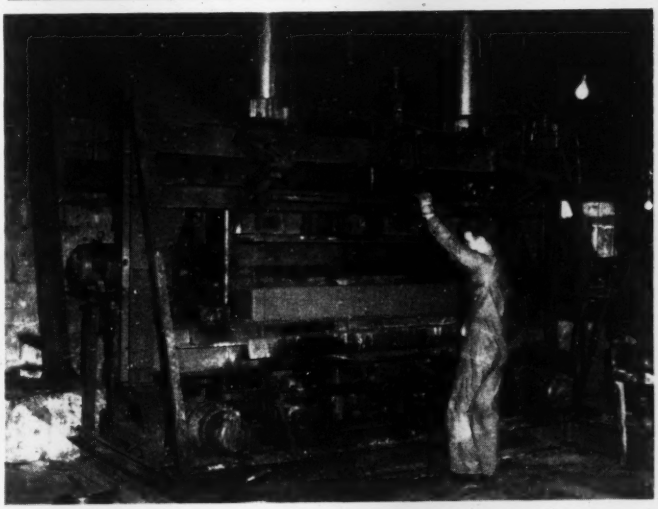
NEW PRODUCTS



Bulldozer and Trailbuilder

New bulldozer and trailbuilder equipment for use with Allis-Chalmers HD-19, HD-14 and HD-10 tractors has been developed. New units have eliminated the overhead "A" frame structure commonly used. Now it is the radiator guard type mounting—rugged and dependable. This mounting can be furnished for either rear or front mounted control units.—SOUTHWEST WELDING & MFG. CO., ALHAMBRA, CALIF.



Concrete Cribbing Machine

No longer must this durable product be made exclusively by hand. The Universal Concrete Pipe Co. of Columbus, Ohio, has built, for its own use, what is believed to be the first cribbing machine in the country. Universal now makes concrete cribbing strictly by machine. During a six and one-half hour period, 132 six-ft. long "header" type pieces can be made on the machine. The cribbing can be used for railroad and highway embankment retaining walls, flood control and levees, soil erosion work, loading docks, bridge abutments, grade crossings and the conservation of valuable industrial property. In the picture, Clyde Wilson, crib machine operator, is shown pulling the lever that raises a "header" from the tamping groove.—THE UNIVERSAL CONCRETE PIPE CO., COLUMBUS, OHIO.

Earth-Moving Equipment

Three new models of Wooldridge cable-controlled earthmoving equipment are in production. These include two four-wheel scrapers and one bulldozer. Scrapers have struck capacities of 8.5 cu.yd. and 12 cu.yd. New scrapers, with unobstructed front apron opening of 60 in., feature rear-draft fulcrum leverage and pivot-tilt bowl to assure faster, more efficient loading and dumping of greater volume. Other engineering advances include higher yoke clearance and greater ruggedness throughout. Cable is easily accessible and reeved in straight lines without reverse bends for increased life and easy replacement. Shorter wheelbase insures quick turning in crowded quarters. All sheaves are mounted away from dirt and load. New bulldozer is designed for rugged service on Allis-Chalmers big HD-19 tractor. Moldboard of 1-in. plate is heavily gusseted to withstand great abuse. Shipping weight of blade is 8,200 lb.; its removable tips are of 1-in. manganese-molybdenum alloy.—WOOLDRIDGE MFG. CO., SUNNYVALE, CALIF.

Heavy-Duty Glove

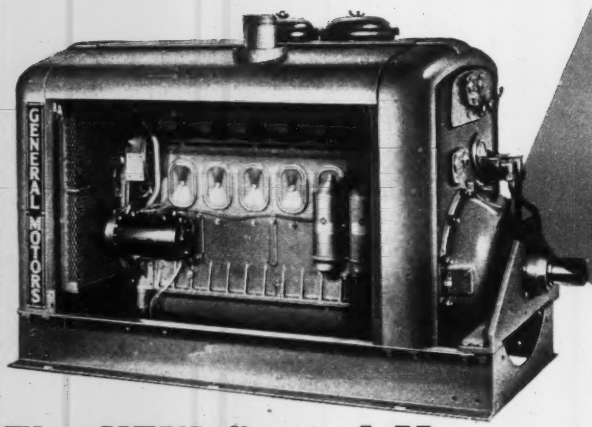
Made of specially treated chrome tanned cowhide for long wear, the glove has a canvas back with elastic strap to overcome hand fatigue while providing a cooler feeling and snug fit. All necessary seams are steel-sewed and the seam along the forefinger has been eliminated. Glove has a short cuff with tape binding.—AMERICAN OPTICAL CO., SOUTHBRIDGE, MASS.

Concrete Mixer

New 3½-S non-tilting concrete mixer has drum and drumheads of heavy steel plate which revolve on wide solid rubber rollers with guides to hold true running location and prevent weaving of drum. Automatic water tank for predetermined quantities of water for each batch. Drum is gear-driven, and heavy roller chain transmits power from engine to countershaft. Complete unit weighs 1,000 lb.—MULLER MACHINE CO. INC., METUCHEN, N. J.

New Radiant Fluorescent

Guthlite, Jr., offers a new outstanding appearance, unusual lighting effect and fine lighting performance. When illuminated, side and spill lighting give it a beautiful radiant glow. This luminous effect is accomplished without glass or plastic panels, so there is no breakage or warpage. Diffuse aluminum louvres provide comfortable shielding and a low brightness at normal angle of view. It features a simple,

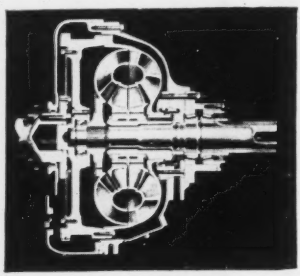


A Combination Torque Converter and Fluid Coupling *Integral with the Engine*

General Motors 71 Diesels equipped with the new GM Torque Converter take up no more space or weight than the same engines with conventional friction clutch and power take-off. Available in 3-, 4-, and 6-cylinder single engine units. Twin 4 and Twin 6 models having engine ratings from 75 to 300 H.P.

The NEW General Motors DIESEL ENGINE-TORQUE CONVERTER UNIT

HERE is a complete, integrated Diesel engine-torque converter unit that combines the inherent efficiency of the GM 2-cycle Diesel engine with the features and advantages of *both* torque converter and fluid coupling. It provides *torque multiplication up to 4 to 1* for starting variable heavy loads. It also provides *highly efficient transmission of power* during light load periods by *automatically shifting to fluid coupling* in the upper speed range.



In the new GM Torque Converter, oil does the work. Automatic transition from torque multiplication of 4:1 at stall to 1:1 in upper speed range.

A smooth, uninterrupted flow of power, delivered through a liquid, *prevents engine stalling* under any load and *protects both engine and driven machinery from sudden shocks.*

One Manufacturer—One Responsibility

Up to now most engines and hydraulic drives have been separate units. The result—compromise designs and divided responsibility. Now General Motors offers a new torque converter specifically designed and manufactured as an integral part of the General Motors Series 71 Diesel engine. It is a self-contained unit built by one manufacturer providing a long needed saving in space and weight as well as certain desirable operating characteristics not available before.

This new power unit will get the most work done in the least time because the engine operates in its most efficient speed range at all times—delivering maximum engine horsepower regardless of the speed of the load. *Maximum torque to start heavy loads PLUS maximum horsepower to keep the load moving.*

Everyone with a hard job to do in the oil fields, in construction, in mining or in logging should have all the facts about this compact, flexible GM Diesel Engine Torque Converter unit. *Write today for a complete description.*

DETROIT DIESEL ENGINE DIVISION

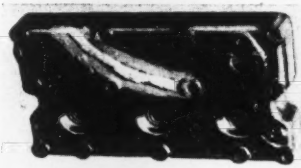
SINGLE ENGINES . Up to 200 H.P. DETROIT 28, MICHIGAN MULTIPLE UNITS . . Up to 800 H.P.

GENERAL MOTORS

GM GENERAL MOTORS DIESEL POWER

DIESEL BRAWN WITHOUT THE BULK

easy-to-open hinge so that louvres may be hinged to either side, or completely removed for easy lamp and starter changes.—The Edwin F. Guth Co., St. Louis 3, Mo.



Welding Cracked Motor Blocks

There is a new, low-heat electrode for welding cracked cast iron motor blocks which may be used for on-the-spot repairs without any preheating or dismantling of equipment. This special Eutectrode 24/49 insures weldability without application of high heat, without cracks or cross checks. Completely machinable through the weld and weld zone.—Eutectic Welding Alloys Corp., 40 Worth St., New York 13, N. Y.

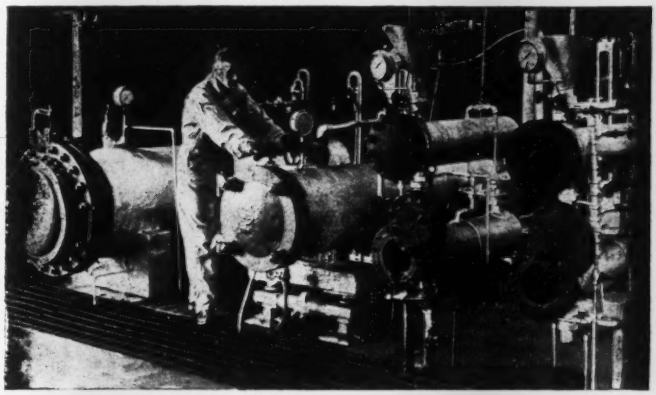
Lightweight Chain Saw

The lightweight die-cast magnesium construction of this gasoline engine chain saw makes it easy for one man to carry. It makes horizontal, vertical or any angle cuts—indexes to any desired angle for felling or bucking. Two gear ratios—easily interchanged—provide a slow speed for cutting big trees—a high speed for cutting small ones. The round nose bucking bar makes it possible to start a cut with the tip of the round end . . . and also permits felling and bucking trees with a diameter twice the bar's length by cutting one-half from one side and the other half from the other side. The engine throttle can be operated from the horizontal cross-bar as well as the right handle so that the engine speed is under finger-tip control whichever handle is being used. This new one or two-man chain saw is available in 18, 24, 36, and 38-in. sizes.—Mall Tool Co., 7740 South Chicago Ave., Chicago 19, Ill.

Hollow Metal Entrance Door

New design of senestra hollow-metal entrance door is furnished in one standardized size of 3x7 ft. May be used in single or double openings. Doors come complete with frames and hardware machined, fitted and ready

These experimental wood-treating cylinders vary in size from 2" x 12" to 4' x 20'. It is possible to make detailed studies ranging from test-tube quantities to semi-commercial quantities.



HOW KOPPERS FAMOUS TECHNICAL LABORATORY

helps improve serviceability of wood

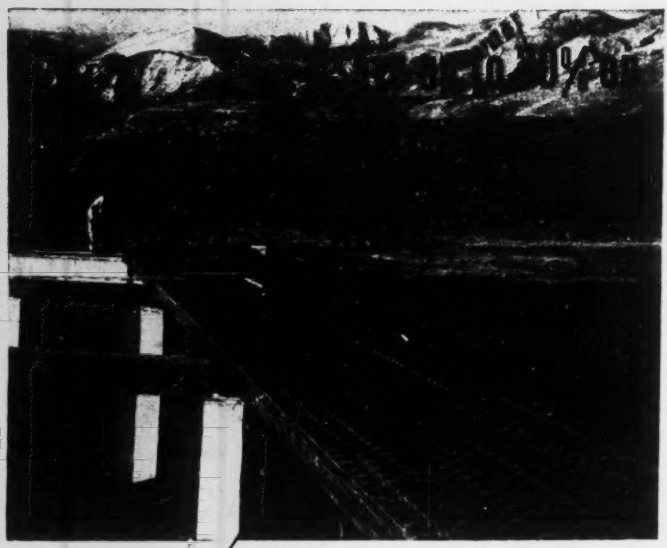
The Koppers Technical Laboratory at Orrville, Ohio is one of the most complete wood-treating laboratories in the world. Here, Koppers experts, working with the best in modern equipment, lead the field in the development of improved wood-preservatives and techniques.

In addition to other research, the staff of this laboratory is constantly working on the following projects: a continuing study of pressure-treatment with creosote; the evaluation of all known treating materials; the development of new preservatives.

▸▸ How Koppers technical facilities can help you!

This famous Koppers Technical Laboratory is now equipped to handle your specific wood-treating problems. Its technical staff welcomes your inquiries, and will gladly recommend the *proper* technique of treatment . . . the *proper* type of preservative to meet your individual needs. Write for further information.

KOPPERS PRESSURE-TREATED WOOD



91-foot Composite Deck bridge built over Tres Pinos creek on Panoche road, 20 miles south of Hollister, California.

Composite Deck Bridges

Low cost, long lasting bridges are made possible by the Timber Structures Composite Deck bridge which combines the economy of wood construction with the serviceability of concrete.

The Composite Deck bridge is a modern improvement on construction which has been proved through years of service. Road surface is concrete, poured over preservative treated laminated panels and permanently keyed to the deck. Construction costs are cut in three ways.

Construction time reduced.

Requires minimum of heavy equipment for construction.

No false work, scaffolding or concrete forms.

Minimum Maintenance . . . Long Life

Structurally, the Composite Deck bridge is as adequate and permanent as other types. There are no joints or parts to deteriorate or become loosened. Preservative treatment gives permanent protection against termites and rot. Painting is not necessary for maintenance.

A folder, "Composite Deck Bridge for Endurance and Economy", gives detailed information about this modern bridge. Get a copy from the Timber Structures office nearest you, or write us for it.

TIMBER STRUCTURES, INC.

P.O. Box 3782 • PORTLAND 8, OREGON

Offices in Boise, Idaho; Eugene, Oregon; Lawrenceville, N.J.; Chicago; Dallas; New York; Seattle; Spokane.

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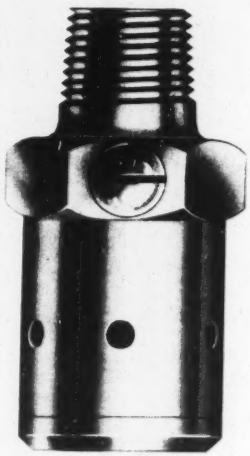
to assemble in order to save installation time for builders. Doors may be hinged right or left to swing in or out and, if desired, are equipped with bronze push and pull bars and bronze ball bearing hinges.—DETROIT STEEL PRODUCTS CO., 3141 GRIFFIN ST., DETROIT 11, MICH.

Metal Primer

Rust-O-Primer is a vinyl base, quick drying wet primer applicable over wet or dry, clean or rusted metal including steel, aluminum or galvanizing. Purpose is to provide a hard, paintable foundation for any type of paints.—WILBUR & WILLIAMS CO., GREENLEAF AND LEON STS., BOSTON.



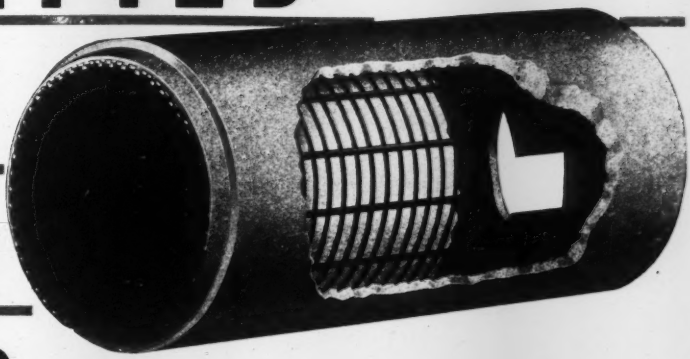
Self-venting Valve

Here is an automatic hot water air valve which the manufacturer claims does away with manual venting of radiators and saves money by eliminating air which interferes with the best radiation.—TACO HEATERS, INC., 137 SOUTH ST., PROVIDENCE 3, R. I.

New Type Water Pump

A new type of water pump which reduces the cost of deep wells has been developed and patented. It is a jack pump type taking a 16-in. stroke at the rate of 50 to 60 strokes per minute. The long, fast stroke permits pumping small-bore holes at a high production rate. The surge resulting from this action if a mechanical head were used is eliminated by the new design. The driving head is hydraulically operated and uses compressed air for balance. The motor transfers the fluid from the low pressure to the high pressure accumulator to build up

VITRIFIED CLAY LINER PLATES



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Meet and Exceed all Specification Standards for

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DESIGN
CURING
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PHYSICAL TEST REQUIREMENTS
CRUSHING STRENGTH TESTS
ABSORPTION TEST
UNIFORMITY

PRACTICAL ADAPTABILITY ON THE JOB

Available in Full Size Range . . . 12" to 102"

★ **UNIVERSAL VITRIFIED and UNITED STATES CONCRETE PRODUCTS**

Sewer Pipe (Vitrified)
Sewer Pipe (Concrete)
Aerodrane Filter Block
Slipseal Sewer Joint
Segment Block
Meter Boxes
Ship-Lap Wall Coping
Liner Plates
Septic Tanks
Drain Tile
Flue Lining
Stove Pipe
Chimney Tops
Chimney Pots
Fire Brick
Fire Clay

UNIVERSAL US CONCRETE

Sales Offices:

Baltimore, Md., Box 7769, Halethorpe Branch, Telephone, Elkridge 790 — Cincinnati, Ohio, P. O. — Newton, Ohio, Box 215, Telephone, Locust 7846.

For Best Pipe Coupling . . .
Specify
UNIVERSAL TYLOX
Flexible Rubber Gaskets
Leakproof for life of the line

Factories: Baltimore, Md., Cincinnati, Ohio, New Philadelphia, Ohio, Palmyra, Ohio (2), Uhrichsville, Ohio (2).

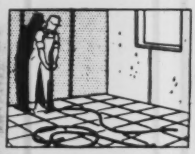
UNIVERSAL SEWER PIPE CORPORATION
UNITED STATES CONCRETE PIPE COMPANY

GENERAL OFFICES • 1500 Union Commerce Building • CLEVELAND 14, OHIO

You can mold ducts in concrete as easy as ABC with . . .

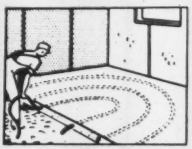
DUCTUBE

The revolutionary pneumatic tubing especially designed for molding holes in concrete and other mastics



A Ductube is inflated, on the job, with an ordinary tire pump or compressed air line.

B Ductube is placed to mold concrete conduit (ducts) as desired. Concrete is then poured.



C When concrete has set, Ductube is deflated and removed, leaving smooth-bore ducts.

ELIMINATES NEED FOR PIPE OR CONDUIT . . . SAVES TIME AND MATERIAL

Ductube is ideal for molding ducts right into concrete walls, floors, columns, beams, or slabs . . . for telephone or electrical wiring, drains, air radiant heating, or any one of numerous other applications suggested by *Ductube's* versatility. *Ductube* molds clean, smooth-bore ducts (either straight or curved, vertical or horizontal), thus eliminating the need for metal pipe or conduit. Available in sizes for producing ducts of 1, 1½, 2 and 3 inches in diameter. *Ductube* can be re-used many times because its special design causes it to free itself, as it is deflated, from the hardened concrete. *Ductube* is truly a miracle of economy worthy of your investigation.

FREE ILLUSTRATED FOLDER TELLS HOW DUCTUBE CAN HELP YOU . . . WRITE DEPT. E. FOR IT WITHOUT DELAY

DUCTUBE COMPANY

940 Shoreham Building Washington 5, D. C.

Stang WELLPOINT SYSTEM

For KNOW-HOW • ENGINEERING • SUPERVISION • EQUIPMENT • to keep jobs DRY

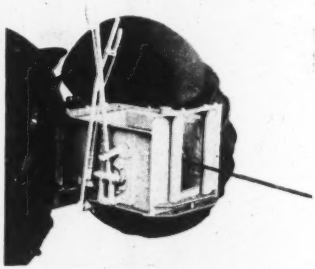
The Stang System has proved its efficiency and economy on both large and small jobs all over the United States. Stang engineering and supervision in planning, installation and operation insures a DRY JOB at all times.

JOHN W STANG CORPORATION

2 Broadway New York 4, N. Y.

8221 Atlantic Ave. P. O. Box 631, Bell, Cal.

air pressure for a pneumatic counterbalance. Then, the motor acts on the hydraulic pump only. The unit consists of a Browne & Sharp fluid pump, a Chicago Belt piston and a transfer valve. The manufacturing operation consists mostly of welding the purchased parts. Installation cost for a 100-ft. well is $500 and the pump sells separately, not including electric motor, for $172. Efficient use of fractional horsepower motors is said to be possible because of very low initial friction. One installation, costing $1,050, is pulling 240 gallons an hour from a depth of 241 ft. with a ¼-hp. motor. Another pulls over 180 gph. from 140 ft. with a ¼-hp. motor.—Floyd D. Hyde, Ray L. Butter, B. F. Darnell and Robt. L. Stockton, El Cajon, Calif.



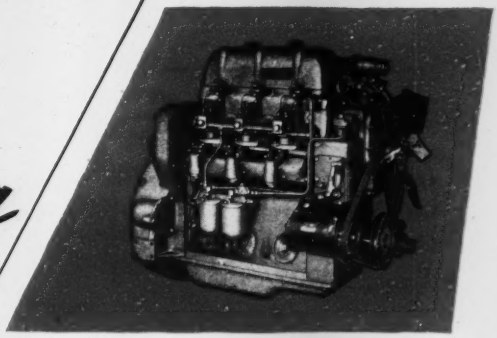
Tractor Winch

Single-drum unit has maximum capacity of 7,500 lb. single-line pull on first layer of cable. Adaptable to many industrial wheel type tractors, it can be easily installed or quickly removed when the power take-off shaft is required for other attachments. Fairlead rollers allow a sharp offlead of the cable to either side and permit easy moving of materials in tight spots. Winch is equipped with a hand-operated contracting band brake. A drawbar built into winch frame allows tractor to perform regular towing jobs without removal of winch.—American Hoist & Derrick Co., 63 S. Robert St., St. Paul 1, Minn.

Steel Casement Windows

Made of cold rolled steel sections, 1¼ in. deep, are designed for strength, rigidity and to permit double glazing with any types of insulating glass. Surfaces offer a smooth base for finishes. Double weathering contact all around frame and ventilator results in complete weathering and water tightness. Corners are mitered and butt-welded, insuring joints that are tight and smooth. Casements are finished in a paint baked on in infra-red baking ovens for durability. Exterior glass may be cleaned from the inside.—Steelcraft Mfg. Co., Cincinnati.

Announcing the New

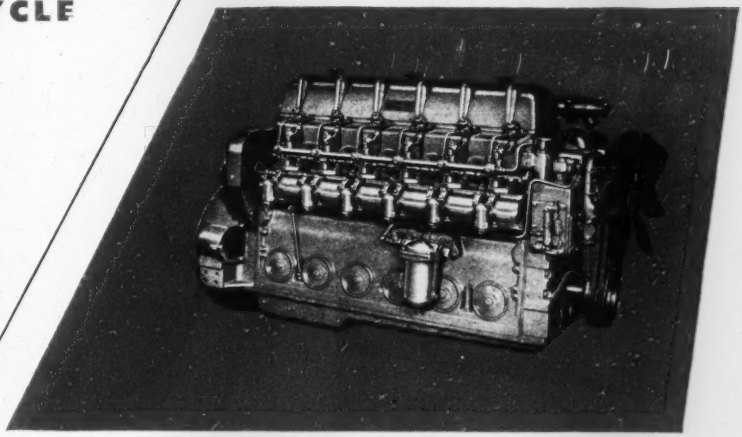


Model 387-C 3 cylinder

P&H DIESELS

2 CYCLE

Model 687-C 6 cylinder



Built for the toughest job known

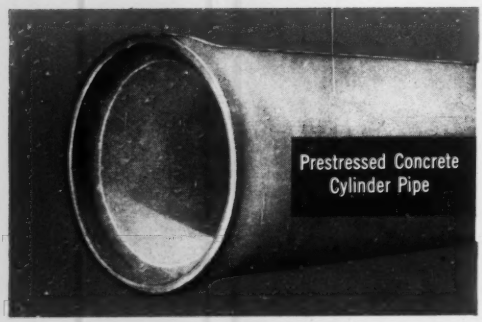
Now — the new P&H Diesels are ready — after years of intensive research, development and testing in the most grueling of diesel applications — excavator service.

The new P&H Diesels introduce a number of advancements in design — in performance — and in easier servicing — which will be welcomed in many fields of diesel usage, mobile, stationary and marine.

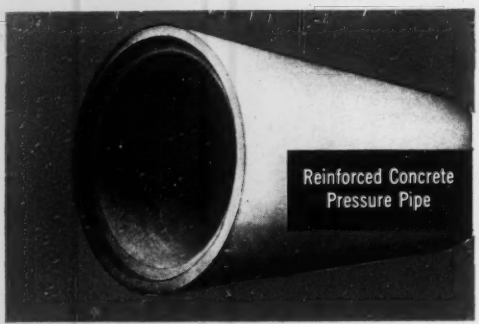
Literature is now available. Address Harnischfeger Corporation, Diesel Division, Port Washington, Wisconsin.

P&H DIESEL DIVISION HARNISCHFEGER CORPORATION

EXCAVATORS · ELECTRIC CRANES · ARC WELDERS · P&H HOISTS · WELDING ELECTRODES · MOTORS



let LOCK JOINT solve your water supply problems



Lock Joint's four designs of reinforced concrete pressure pipe answer any problem in the field of large-diameter water supply conduits.

All of these designs may be equipped with Lock Joint's flexible, self-centering Rubber and Steel Joint, which simplifies installation and reduces the initial cost of laying the line.

Lock Joint Reinforced Concrete Pressure Pipe is made in all standard diameters from 16" up, and will withstand any pressure common to American water works practice.

★ ★ ★

Your inquiry at any of the Company's offices will receive a prompt reply.

LOCK JOINT PIPE COMPANY

Est. 1905

P. O. Box 269, East Orange, N. J.

PRESSURE PIPE PLANTS
Wharton, N. J., Turner, Kansas

BRANCH OFFICES:
Cheyenne, Wyo. • Denver, Colo. • Kansas City, Mo. • Valley Park, Mo. • Chicago, Ill. • Rock Island, Ill. • Wichita, Kan. Kenilworth, N. J. • Hartford, Conn.

LOCK JOINT
Reinforced Concrete
PRESSURE PIPE

SCOPE OF SERVICES

Lock Joint Pipe Company specializes in the manufacture and installation of Reinforced Concrete Pressure Pipe for Water Supply and Distribution Mains in a wide range of diameters as well as Concrete Pipe of all types for Sanitary Sewers, Storm Drains, Culverts and Subaqueous Lines.

★ ★ ★

You Have The Rock

We Have The BIT

Get them together and you will have the formula for greatly reduced drilling costs. It doesn't matter what kind of rock it is; there's a Timken Rock Bit to match and master it—including a carbide insert bit.

What makes the Timken Bit superior for rock drilling? (1) a removable principle that has proved its correctness by more than 14 years service under all rock drilling conditions in mines and construction work. (2) Timken Steel developed especially for Timken Rock Bits and produced in our own steel plant. (3) Timken metallurgical "know how" in heat treatment and hardening. (4) uniform quality and performance; every Timken Bit will give the same outstanding service in speed of penetration and depth drilled when used in the same kind of rock.

No matter where you are there's a Timken Rock Bit distributor within telephone call. Conversion and reconditioning shops also are conveniently located for quick service. Put Timken Bits to work now—cut drilling costs, increase production.

THE TIMKEN ROLLER BEARING COMPANY, CANTON 6, OHIO
CABLE ADDRESS "TIMROSCO"

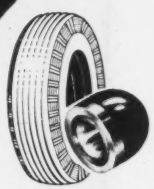
TIMKEN
TRADE-MARK REG. U. S. PAT. OFF.
ROCK BITS

Reduce Form Damage with NEW VIBER RUBBER TIPPED VIBRATORS

Viber Company has long recognized the destructiveness of steel vibrators on many popular form lining materials.

Realizing that damage to Celotex, plaster of Paris inserts for architectural concrete and plywood is expensive, they studied the possibility of using RUBBER TIPPED VIBRATORS.

After critical tests on many large concrete construction jobs, it was found that the new VIBER RUBBER TIPPED VIBRATORS greatly reduced form costs.



Made of high quality live rubber, Viber's Rubber Tipped Vibrators are built to withstand extreme punishment (the same rubber used to make automobile tires)

New style housing with replaceable rubber tips may be used in place of one-piece steel housing. Rubber tips are easily replaced. Simply unscrew worn part and install new tip.

Available in three standard VIBER sizes:

For additional information please write or wire:

VIBER RUBBER TIPPED VIBRATORS MINIMIZE GRINDING AND GREATLY REDUCE FORM FACE DAMAGE AND FORM REPLACEMENT.

VIBER CO. CONCRETE VIBRATORS
EST. 1931 Dept. 20 726 South Flower Street · Burbank, California

Manufacturers' Publications

Welded Bridges—Sixteen pages of a reprint offer a review of welded bridges constructed in the United States, Canada and various foreign countries during the last twelve years, and of practices in specifying steel material, details of design and methods of construction. Also included is a review of the results of some German fatigue tests of welded beams, fatigue fractures in girders and stringers of riveted railway bridges and the repairs that are made by welding. Eighteen photographs, two diagrams and four tables augment the article itself.—AIR REDUCTION, 60 EAST 42ND ST., NEW YORK 17, N. Y.

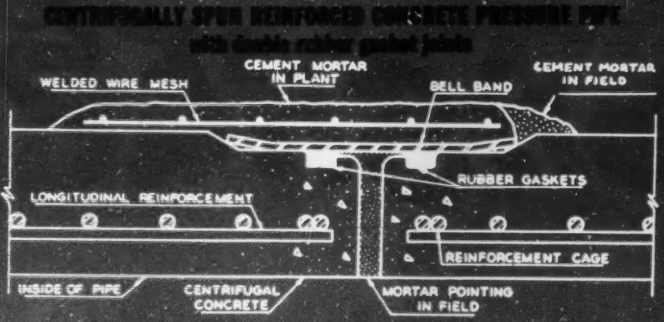
Longer Pump Service—A booklet, "How To Get Longer Service From Your Pumps," contains eight illustrated pages in which four factors that affect pump life and performance are discussed. These are corrosion, corrosion-fatigue, erosion and wear. Definite case histories are cited in connection with exposure to such destructive influences as sewage, brackish harbor water, sour crude petroleum, marine growth, high pressures, and grit as well as combinations of these influences.—THE INTERNATIONAL NICKEL CO., INC., 67 WALL STREET, NEW YORK 5, N. Y.

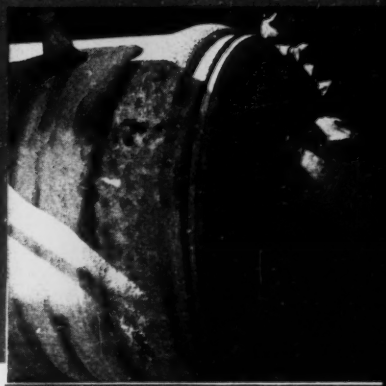
Runway Light—The construction, performance, and installation of the Westinghouse Type HL High Intensity Runway Light are discussed in an 8-page booklet. This CAA light is suitable for use under diverse weather conditions. It is actually two units in one, a high-tensity light for low-visibility conditions, and a standard elevated runway light for normal visibility conditions.—WESTINGHOUSE ELECTRIC CORP., BOX 868, PITTSBURGH 30, PA.

Cement Gun—A 65-page booklet describes and illustrates many of the uses of the machine made under the trade mark and trade name "Cement Gun," and its sand-cement product, "Gunite."—CEMENT GUN CO., ALLENTOWN, PA.

Wood Decay—"Protecting Your Investment in Wood," is a brochure explaining how and why wood decay occurs, and showing methods of treatment to prevent such loss.—CHAPMAN CHEMICAL CO., DERMON BUILDING, MEMPHIS 3, TENN.

DON'T OVERLOOK SAVINGS in pipeline construction costs to reduce cost of delivered water





Installing rubber gasket in groove on spigot end of pipe.

(Above) Joint sections ready to slip into place — as a cork fits in a bottle.

(Below) Pouring soupy mortar into outside annular space — tar paper confines mortar to joint area. Inside space is pointed by hand in pipe 24" and larger, or "buttered" and swabbed in pipe under 24" diameter.

These savings are important to everyone concerned with main water supply line design, construction and operation:

1. **To Design Engineers** who want a watertight closure simple in design, rugged in construction, flexible and positive in service. Straight steel joint sleeves permit some pulling of joints to allow for minor changes in alignment or grade, while angle sleeves may be used to provide for larger deflections. This unique joint is also adaptable for connecting to fabricated elbows, reducers and other fittings.

2. **To Contractors** who desire ease and speed of installation. Steel joint sleeve is fitted in the plant to one end of each section of pipe — in effect a bell and spigot rubber gasket joint. 12 ft. sections facilitate laying. There's no need to dig bell-holes, no circumferential welding, no laborious and costly caulking. Immediate back-filling is recommended — an important cost-saving factor in itself.

3. **To Owners, Water Users and Taxpayers** who desire maximum economies in cost of delivered water. Low first costs, plus the proven advantages of performance, sustained carrying capacity and freedom from maintenance expense assure substantial savings.

This type of centrifugally spun reinforced concrete pressure pipe is helping to make substantial savings in construction costs on Unit 5, Coachella Valley Distribution System, a U. S. Bureau of Reclamation project. Information and specifications regarding this class of pipe are available on request.

American PIPE AND CONSTRUCTION CO.

Concrete Pipe for Main Water Supply Lines, Storm and Sanitary Sewers, Subaqueous Pipe Lines.

P. O. Box 3428, Terminal Annex • Los Angeles 54, California

QUALITY PIPE LINE PRODUCTS MANUFACTURED AND INSTALLED BY AMERICAN INCLUDE HUME CENTRIFUGAL CONCRETE PRESSURE PIPE, AMERICAN CONCRETE CYLINDER PIPE, PRESTRESSED LOCK JOINT CONCRETE CYLINDER PIPE, LOCK JOINT CONCRETE CYLINDER PIPE.

Main Offices and Plant — 4635 Firestone Boulevard, South Gate, California
District Offices and Plants — Oakland — San Diego — Portland, Oregon

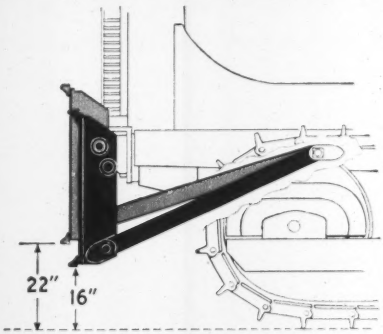
HD-19 TORQUE

OUTPUSHES

. . . On Any Job, Any Time

***Shortens* Time in Cut.** You get heaping loads fast with the BIG HD-19 pushing. A powerful, 40,000 lb. tractor with long, wide, sure-gripping tracks . . . it gets in there and really "bears down."

What's more — makes contact faster with any make or type scraper combination — no trundling along behind trying to catch up. Hangs on, too, throughout entire loading period — no losing scraper, no sudden, jarring contacts because there's no stopping to shift. Torque Converter automatically synchronizes HD-19's speed with speed of loading unit. And with a final, extra boost, gets scraper off to fill with a flying start. Result — MORE YARDS MOVED AT LESS COST PER YARD.



NEW HEAVY-DUTY, ADJUSTABLE PUSHER PLATE NOW AVAILABLE FOR HD-19. It's bigger, stronger, heavier — weighs 1,600 lbs. It's adjustable — operates at 16" or 22" above ground . . . pushes any make scraper or self-powered hauling unit.

CONVERTER TRACTOR

OUT-'DOZES

Of Year, Under Any Conditions

Shortens **Time on Every Bulldozing Job.** The heavier, sure-footed, better-balanced HD-19, working with especially matched bulldozers — plus having the advantages of the Torque Converter drive — assures greater output on bulldozing. Operator can take a deeper cut, roll bigger loads faster . . . and get back for the next pass quicker — has a high reverse of 5.5 m.p.h. Load and terrain and use of throttle govern forward speed . . . and there's no worrying about engine stalling when tractor is overloaded — keeps running, regardless.

And because the HD-19 is on tracks it can be used everywhere on the job — on wet, sandy or rocky going . . . no job too tough for it to handle. "Seeing is believing" . . . watch it outperform. Contact your Allis-Chalmers dealer.

ALLIS-CHALMERS

TRACTOR DIVISION • MILWAUKEE 1, U. S. A.

ORIGINATOR OF THE TORQUE CONVERTER TRACTOR

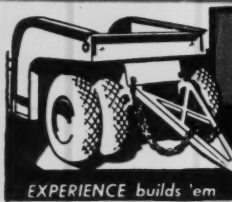
THEY Roll-Along ON ROGERS TRAILERS

MORE AND BIGGER LOADS
Everyday - Everywhere

An impressive number of the biggest contractors TODAY repeatedly put their confidence in ROGERS TRAILERS long proven ability to "deliver the goods" and "stand the gaff" over long periods of heavy usage.

Smaller operators, too, find in the extensive ROGERS LINE, the answer to their particular trailer requirements with proper capacity, road clearance, type of construction and strength with lightness.

We solicit inquiries which make your trailer problems our problems and we generally come up with the correct answer.



ROGERS BROS. CORP.

DESIGNERS and BUILDERS OF HEAVY DUTY TRAILERS SINCE 1915

EXPERIENCE builds 'em PERFORMANCE sells 'em

135 ORCHARD ST. ALBION, PENNA.

Manufacturers' Activities

Sales—Geo. G. Raymond, Jr., sales manager of LYON-RAYMOND CORP., Greene, N. Y., has been elected vice-president of the board of directors . . . A reorganization of the field supervision of the mechanical goods sales division of GOODYEAR TIRE & RUBBER CO. has been announced. Eastern sales division will be in charge of O. A. Schilling; central, H. E. Langdon; southern, R. B. Warren; western, R. G. Abbott. M. W. Sledge is assistant manager of the belting sales department . . . Bruce A. Dean is general sales manager of the Plywood division of the MENGEL CO., Louisville, Ky. . . . Edward B. Hill is now vice-president in charge of sales for GAR WOOD INDUSTRIES, INC., Wayne, Mich. . . . Geo. Wacker goes to Oakland, Calif., as assistant to the western sales manager of R. G. LE TOURNEAU, INC.; Geo. Goettsche is sales representative for the new factory branch of LE TOURNEAU at Oakland; A. W. Travis is district sales representative at Portland, Ore., for Oregon, Washington, British Columbia, and Alaska; L. D. Le Tourneau, brother of President, R. G. Le Tourneau, is logging specialist in the Northwest; Geo. C. Summers is district sales representative at Columbus, Ohio, for Kentucky, Ohio, Michigan, Ontario and Quebec. Four department heads—R. P. Nichols, D. K. Heiple, E. E. Weveneth and H. R. McQuarrie—recently flew in a company owned Lockheed Lodestar to 18 cities on a 10,000-mile air hop to visit 48 heavy equipment distributors in the U. S. and Canada. . . . Harold T. Chester has been appointed tramway sales engineer of AMERICAN STEEL & WIRE CO., succeeding Wm. C. Kuhn, retired. . . . Levi W. Reeves is assistant sales manager of the Memphis, Tenn., office of the TENNESSEE COAL, IRON & R. R. CO. . . . J. E. Poole is general sales manager of the KEYSTONE ASPHALT PRODUCTS CO.

Fred Zimmerman is now director of sales, and J. J. Sieber sales manager of BRODERICK & BASCOM ROPE CO., St. Louis, Mo. . . . BINKS MFG. CO., Chicago, has appointed H. J. Fink to direct sales and service in Colorado, Kansas, Nebraska, Wyoming, Montana and New Mexico from Longmont, Colo.; C. J. Rood is manager of the Branch in Indianapolis, Ind.; M. B. Scully at Princeton, Ill., for Iowa and northern Illinois; E. J. Cremer at St. Louis for Missouri and

(Continued on page 105)

Continuous Research and Development at **Amcreco**

means longer life and less maintenance

Amcreco
Lowry Process
Creosoted Products

Timbers • Piles • Planking
Framed Bridge Timbers
Adzed and Bored Cross Ties • Bridge Ties
Poles • Cross Arms • Conduit

The ever-increasing life expectancy of Amcreco Creosoted Products is no accident. It is the direct result of continuing research and development at Amcreco. With the tried and proven Lowry pressure creosoting process as the foundation, refinements and improvements in treatment techniques have in many instances doubled and even tripled service life in the space of the last 25 years.

Backed by this progressive program Amcreco Creosoted Products are your best assurance of long life and minimum maintenance. For greater all-around economy on your next job, specify Amcreco.

Pressure-treated for strength that lasts!

AMERICAN CREOSOTING COMPANY
INCORPORATED
COLONIAL CREOSOTING COMPANY INCORPORATED
GEORGIA CREOSOTING COMPANY INCORPORATED
LOUISVILLE, KENTUCKY

New UNIT 1520 Self-Propelled RUBBER-TIRED CRANE

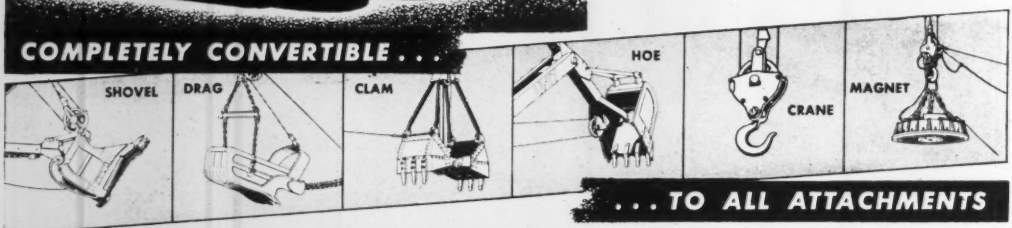
15 TON CAPACITY

This 50,000 pound Mobile Crane is a completely new member of the UNIT Crane and Shovel line. Designed for both "on and off" highway operation. So compact, it works efficiently even in small, cramped quarters, "in or out" of the yard.

- Rugged . . . Perfectly Balanced
- Hook Roller Construction
- Controlled and Operated by ONE Man
- Powered by ONE Engine
- Hydraulic Steering . . . Air Brakes and 4 Speed Air-Actuated Transmission
- Heavy Duty, yet operated with remarkable SPEED . . . SAFETY . . . ACCURACY . . . ECONOMY!

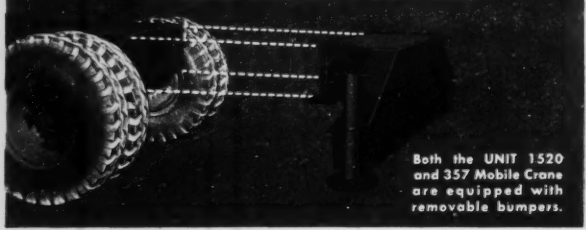
UNIT CRANE & SHOVEL CORP.
6315 W. BURNHAM STREET
MILWAUKEE 14, WISCONSIN, U. S. A.

COMPLETELY CONVERTIBLE . . .



. . . TO ALL ATTACHMENTS

REMOVABLE BUMPERS



Both the UNIT 1520 and 357 Mobile Crane are equipped with removable bumpers.

Greater digging efficiency is attained in excavating by removal of one bumper. Permits additional space to lower boom, thus increasing digging depth in trenching or other excavating jobs. Provides close-range operation on shovel work. Bumper is bolted to undercarriage frame and its removal is a simple operation.

UNIT 357 MOBILE CRANE

WITH SHOVEL ATTACHMENT
• Self-Propelled • Rides on Rubber • Has 1001 Uses.

SHOVELS • DRAGLINES • CLAMSHELLS • CRANES • TRENCHOES • MAGNETS

POWER

You can't beat EXIDE BATTERIES for dependable Diesel cranking

For peak performance, use Exide Diesel Cranking Batteries! They're built specially for the job . . . with mighty power to handle the toughest cranking . . . with extra ruggedness for hard service in all climates . . . and in types and sizes for on and off the highway automotive equipment of every kind.

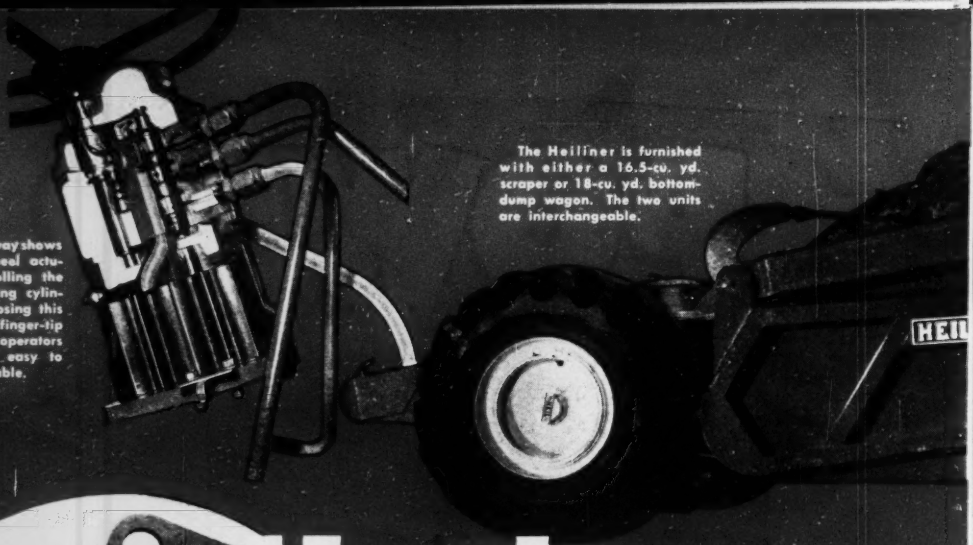
Manufacturers, owners and operators of Diesel powered trucks, tractors, and earth-moving units can always count on Exide Batteries for dependable performance, long battery life and low cost maintenance.

Exide
BATTERIES

1888 . . . Dependable Batteries for 61 Years . . . 1949

"Exide" *Reg. Trade-Mark U. S. Pat. Off.*

THE ELECTRIC STORAGE BATTERY COMPANY, Philadelphia 32 • *Exide Batteries of Canada, Limited, Toronto*



This Hydro-Steer cut-away shows how the steering wheel actuates the valve controlling the oil flow to the steering cylinders. Opening and closing this valve requires only finger-tip pressure. That's why operators find the Heiliner so easy to handle, so maneuverable.

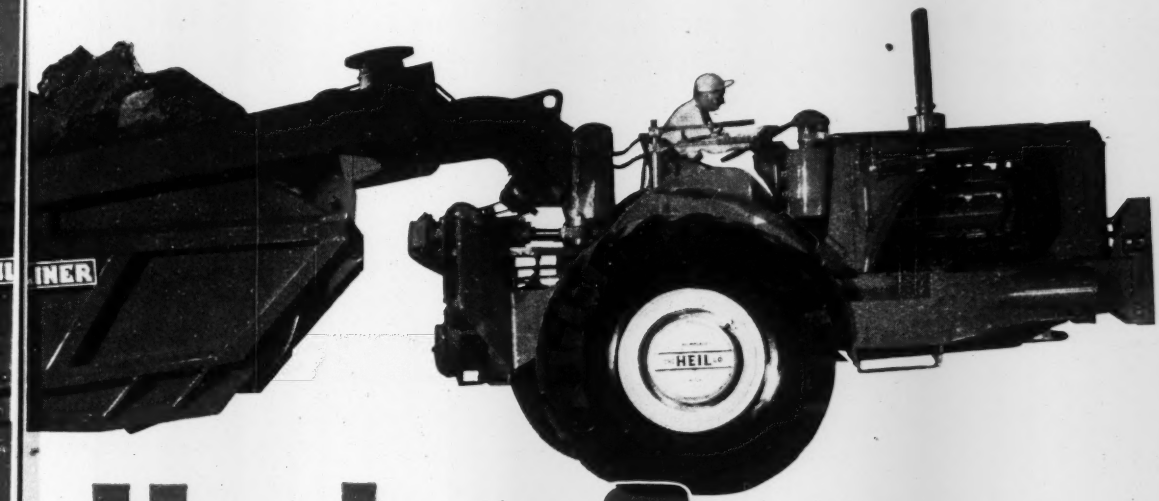
The Heiliner is furnished with either a 16.5-cu. yd. scraper or 18-cu. yd. bottom-dump wagon. The two units are interchangeable.

Heiliner

Take a good look at this husky heavy-duty hitch. Its swivel-type design permits complete freedom of movement between the 2-wheel tractor and scraper. Note also the powerful hydraulic steering pistons. The pistons and sturdy hitch work as a team, preventing nosing, snaking, or jackknifing. Over-steering is eliminated through the use of positive mechanical stops.

This phantom view illustrates the Heiliner's steering system. At the front is the pump which supplies oil at all times. The oil is metered by the Hydro-Steer mechanism to the two opposed, double-acting, direct-connected hydraulic steering cylinders. Steering is safe, positive, and effortless.

From the operator's point of view, there's nothing that compares with the Hydro-Steer. It lets him turn the 39-foot Heiliner in a 22-ft. radius. And, he can do it with one hand. Such easy maneuverability means more round trips, more dirt moved, lower costs.



Hydro-Steer

the right steer to larger earthmoving profits

1. Because the Heiliner's patented hydraulic pump delivers a constant volume of oil, regardless of engine rpm -- for safe, positive steering at all times.

2. Because your operator can handle a fully loaded Heiliner (wt. 45 tons) with passenger-car ease, maneuver quickly for faster cycles, move more dirt.

These and many other Heiliner features help you make larger earthmoving profits. Get the full story on the Heiliner and Heil's complete line of earthmoving equipment. Check the coupon and mail it today.

HEIL

THE HEIL CO., Dept. 149, 3001 W. Montana Street, Milwaukee 1, Wisconsin

Please send me complete information on the items I have checked below:

- ☐ **Heiliner**—2-wheel prime mover
- ☐ **Heil Scrapers**—tractor-drawn
- ☐ **Heil Hydraulic Dozers**—specify make of tractor
- ☐ **Heil Cable Dozers**—specify make of tractor
- ☐ **Heil Power Control Units**
- ☐ **Heil Light-Duty Dump Bodies**—specify make of truck
- ☐ **Heil Heavy-Duty Dump Bodies**—specify make of truck
- ☐ **Heil Platform Conversion Hoists**

Name ..... Title .....

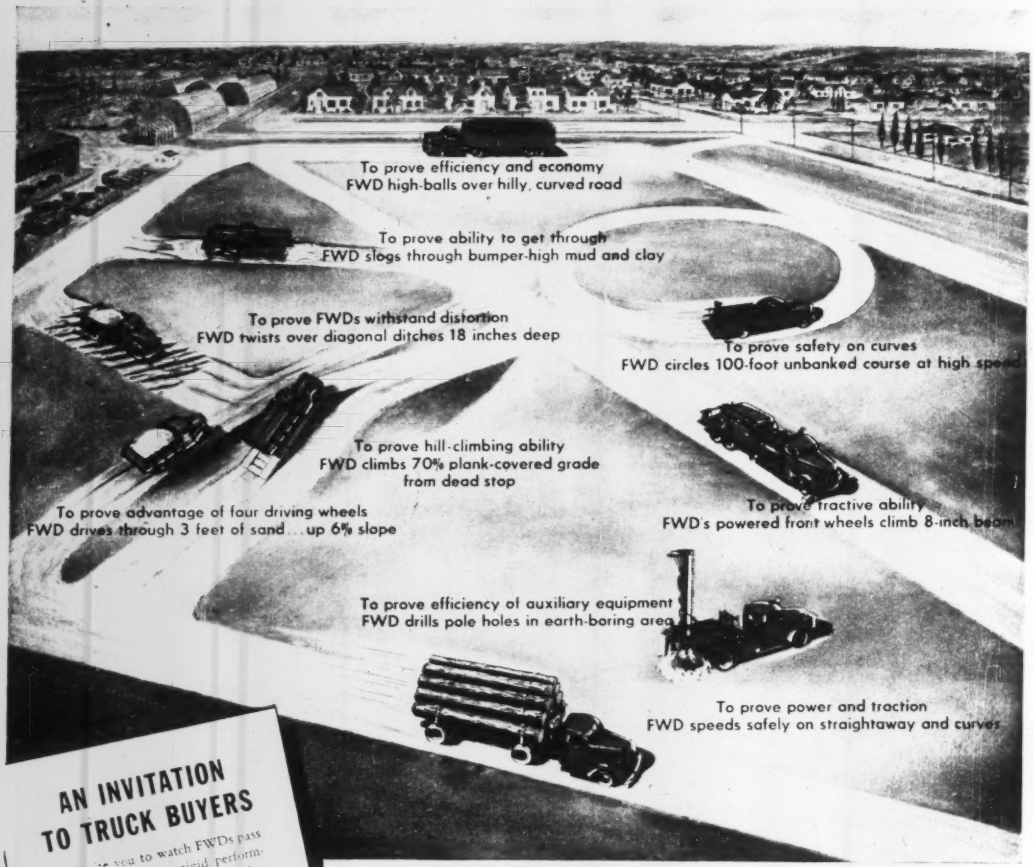
Company .....

Address .....

City ..... ( ) State .....

PROOF - *not Guesswork*

Makes FWD America's Foremost Heavy-Duty Truck


To prove efficiency and economy
FWD high-balls over hilly, curved road
To prove ability to get through
FWD slogs through bumper-high mud and clay
To prove FWDs withstand distortion
FWD twists over diagonal ditches 18 inches deep
To prove safety on curves
FWD circles 100-foot unbanked course at high speed
To prove hill-climbing ability
FWD climbs 70% plank-covered grade from dead stop
To prove advantage of four driving wheels
FWD drives through 3 feet of sand . . . up 6% slope
To prove tractive ability
FWD's powered front wheels climb 8-inch beam
To prove efficiency of auxiliary equipment
FWD drills pole holes in earth-boring area
To prove power and traction
FWD speeds safely on straightaway and curves

AN INVITATION TO TRUCK BUYERS

We invite you to watch FWDs pass a series of the most rigid performance tests. Ask your FWD distributor to arrange for you to visit our Plant. Or — if you can't get away, ask him to show you the movie, *The FWD Story*. In either case, you will see for yourself how FWD trucks can help solve your heavy-duty trucking problems.

Walter A. Olen
President
The Four Wheel Drive Auto Co.

YOU want to know that your truck can climb steep grades . . . drive through deep snow, mud or sand . . . get you through to off-the-road locations. You want to know it can speed heavy loads safely over slippery highways . . . that it can get you around sharp curves without skidding. You want to know your truck has the stamina to insure long life . . . that it will do it without expensive mechanical breakdowns.

You can be sure it will if it's an FWD! What's more, with FWDs, you can be sure of these advantages — *even before you buy.* And here's why. On FWD's proving ground, you get proof — *not guesswork* — of what an FWD will do for you. A series of scientifically designed torture tests duplicates every operating condition you're liable to meet. Yes . . . FWDs prove themselves thoroughly.

Find out what this can mean to you. See your FWD distributor — or write direct for complete facts about FWD Trucks.

THE FOUR WHEEL DRIVE AUTO COMPANY
Clintonville, Wisconsin
Canadian Factory: Kitchener, Ontario
FOUR AND SIX WHEEL DRIVE TRUCKS

America's Foremost Heavy-Duty Truck

southern Illinois; B. R. Futon, Cleveland, Ohio, for Ohio; J. J. Lynch, Springfield and Boston, Mass., for New England and greater Boston area; and H. J. Dueno at Milwaukee, Wis., for Wisconsin, peninsular Michigan, Minnesota, and North and South Dakota . . . W. M. Holland is in charge of engine sales for INDUSTRIAL POWER division of INTERNATIONAL HARVESTER Co., I. P. Payne is assistant division sales manager, H. R. Carlson is southwest region manager . . . W. H. Hammond has been elected vice-president, sales, of MARION METAL PRODUCTS Co., Marion, Ohio.

Distributors—A. B. JUDD SUPPLY Co., Houston, Tex., is now a distributor for TUBE-TURN welding fittings and flanges . . . New distributors for PENN DRAKE petroleum and specialty products in the Cleveland area are the BLUMEL IGNITION Co., 14,201 Euclid Ave., East Cleveland; Maley & Mellert Co., 3,601 Carnegie Ave., Cleveland; and MOTOR TRUCK EQUIPMENT Co., 12,000 Harvard Ave., Cleveland . . . New distributors for the OSGOOD Co. and THE GENERAL EXCAVATOR Co., Marion, Ohio, are CONTRACTOR'S SERVICE, INC., 317 W. Worthington Ave., Charlotte, N. C.; DULANEY SERVICE Co., Box 96, San Antonio 4, Tex.; and the MANNING EQUIPMENT Co., 17,560 Chicago Ave., Lansing, Ill. . . . COLONIAL ELECTRIC PRODUCTS, INC. of East Paterson, N. J., has appointed COLONIAL SALES DISTRIBUTORS of Rochester, N. Y., as regional factory distributor for cold cathode fixtures and 15,000-hour lamps.

Personalities—Jack B. Bond has been appointed district manager of the central territory for the crusher and process machinery division of the NORDBERG MFG. Co., Milwaukee, Wis. . . . Melvin C. Harris has resigned as vice-president in charge of production of ALLEGHENY LUDLUM STEEL CORP., C. B. Pollock is now in charge of production . . . Alfred I. Stuart is head of the methods engineering department of the HYSTER Co., Portland, Ore. . . . Joe Lavery, formerly with LONE STAR CEMENT Co., in Charlotte, N. C., has joined the STATE MACHINERY & SUPPLY Co., INC., of Columbia, S. C., to cover southeastern South Carolina. . . . Walter F. Spoerl is general sales manager, under supervision of Vice-president E. G. Brown, for all divisions of the U. S. RUBBER Co. Robert D. Gartrell is development manager for all divisions. Wesley A. Armstrong is production manager . . . Vincent Vandervoort has been elected vice-president of MARLOW PUMPS, Ridgewood, N. J. . . . The ASPHALT INSTI-

(Continued on page 108)

PAT. NO. 2,297,928

A Complete Unit for a Complete job

You're always *sure* you're getting the very best in efficient, economical packaged air conditioning when you specify Governair—the original patented design!

This complete unit is easy to install—requires only simple electrical, water and duct connections. Built-in Evaporative Condenser keeps water usage down to a minimum. Governair engineering assures correct co-ordination and balance of all functions. Generously proportioned heat transfer surfaces provide maximum performance and economy.

Choose Governair completely packaged air conditioners and you'll *always* do your best!

Originators of Completely Packaged Air Conditioners

GOVERNAIR

ARCHITECTS, ENGINEERS, CONTRACTORS

Would you like to know how Air Conditioning jobs can be installed for from $100.00 to $400.00 per ton less?

Write Dept. H

GOVERNAIR CORPORATION
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Oklahoma City, Okla.

DRILLING CONTRACTORS

DIAMOND AND SHOT CORE BORINGS — DRY SAMPLE BORINGS

Foundation Testing for Bridges, Dams and all Heavy Structures

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Manufacturers of Diamond and Shot Core Drills, Accessories and Equipment

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PNEUMATICALLY PLACED CONCRETE
DENSE · DURABLE · HIGH STRENGTH

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Restoring Disintegrated Concrete
Dam, Dock and Bridge Repairs
Steel Encasement and Fireproofing
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Stack and Bunker Linings
Wood Pile Casings—Pressure Grouting
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TELSMITH

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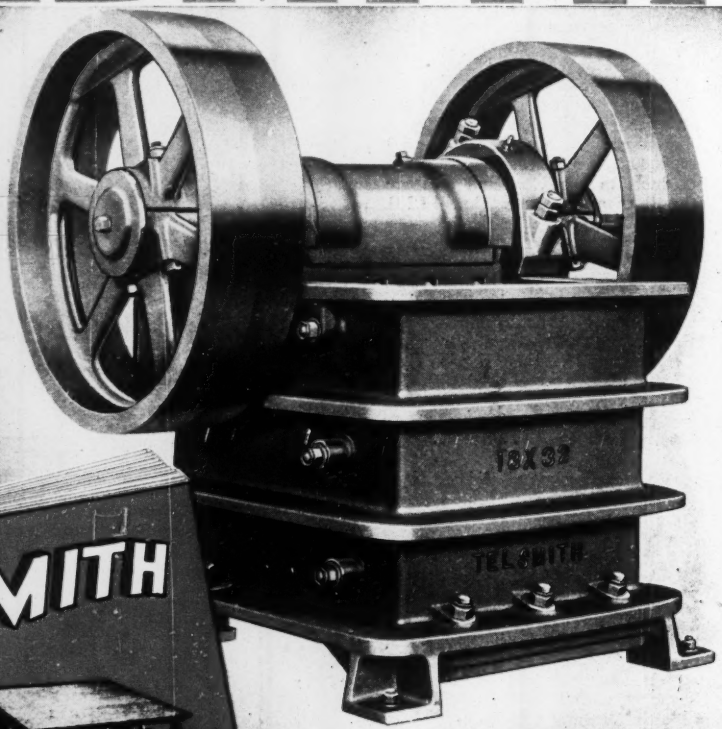
Primary Crushers

Jaw Crushers: Sizes: 10 x 16 in. to 30 x 42 in., 22 to 240 tons per hr. capacity.

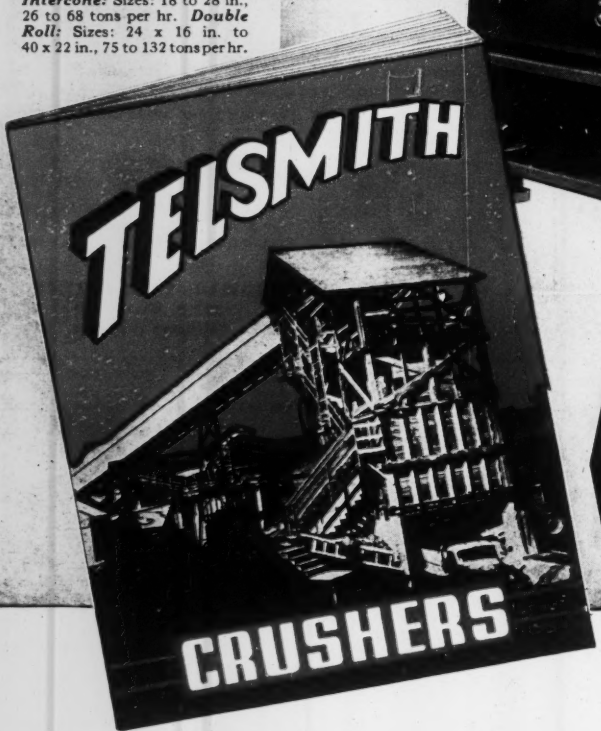
Gyratory Breakers: Sizes: 6B to 25B, 26 to 400 tons per hr.

Secondary Crushers

Gyrasphere: Sizes: 24 to 48 in., 15 to 210 tons per hr. ***Intercone:*** Sizes: 18 to 28 in., 26 to 68 tons per hr. ***Double Roll:*** Sizes: 24 x 16 in. to 40 x 22 in., 75 to 132 tons per hr.



JAW CRUSHERS



NEW 40-PAGE CRUSHER GUIDE

to profitable operation . . . together with descriptive Bulletin on Telsmith's latest crushing development—the new Intercone Crusher . . .

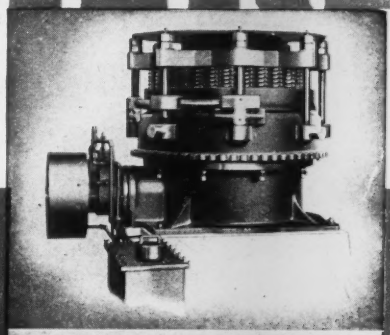
FREE ON REQUEST

CS-6

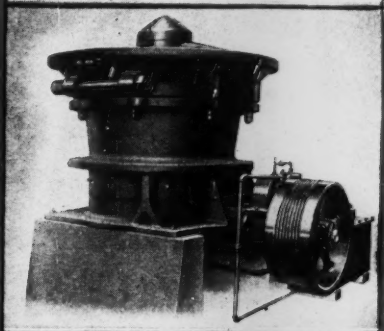
CRUSHERS

for
BETTER PRODUCT • BIGGER CAPACITY
LOWER COST

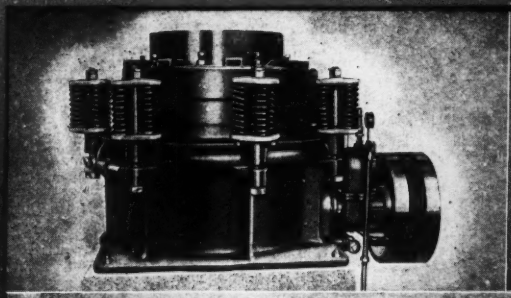
• What do you want to crush? What size product do you want to make? Coarse . . . fine . . . intermediate . . . or a wide range of sizes? Telsmith Crushers can do it for you—most *dependably*. You can be *sure* that Telsmiths will be right for your particular job *always*. Because Telsmith builds crushers of *all types*. And Telsmith engineers have no reason whatever to be prejudiced for or against any one type of crusher. Consult Telsmith Engineers . . . get their unbiased crusher recommendations for your plant. Find out how the latest features in modern crusher design give you top tonnage, exceptional product quality, low cost . . . get new crusher catalogs C-2 and I-2.



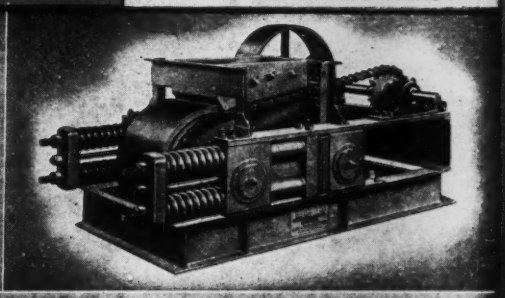
GYRASPHERE CRUSHERS



GYRATORY BREAKERS



INTERCONE CRUSHERS



DOUBLE ROLL CRUSHERS

SMITH ENGINEERING WORKS, 500 EAST CAPITOL DRIVE, MILWAUKEE 12, WISCONSIN

Cable Address: Sengworks, Milwaukee

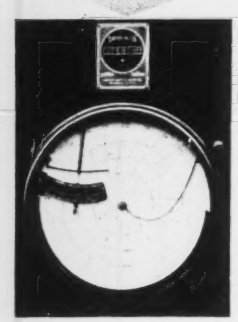
51 East 42nd St. New York 17, N. Y. · 211 W. Wacker Drive Chicago 6, Ill. · 713 Commercial Trust Bldg. Philadelphia 2, Pa. · 238 Main Street Cambridge 42, Mass. · Boeheck Eqpt. Co. Milwaukee 3, Wis. · Henry M. Wood Co. Cincinnati 6, Ohio

Clyde Eqpt. Co., Portland 9, Ore., & Seattle 4, Wash. • General Machinery Co., Spokane 1, Wash. • Brandeis Machinery & Supply Co., Louisville 3, Ky. • Rish Eqpt. Co., Charleston 22, & Clarksburg, W. Va.—Roanoke 7, & Richmond 10, Va. • Wilson-Weesner-Wilkinson Co., Knoxville 3, & Nashville 6, Tenn.

SIMPLEX

TYPE MS METER

Meets Highest Standards for Accuracy and Sensitivity!



Note these important features:

- Bell shaped float translates the half power of the differential into uniform graduations of dial and chart.
- Evenly spaced charts . . . easily read at high as well as low rates.
- Continuous type integrator — eliminates intermittent movement.
- High accuracy of flow readings — over long ranges — 10 to 1 or 7.6 to 1.
- Wall panel or floor mounting — electric or spring wound clock optional.
- Rugged construction — simplified design that permits servicing by plant personnel.

Write for full information to

The Simplex Valve & Meter Company, Dept. 4, 6751 Upland Street, Philadelphia 42, Pa.

SIMPLEX

VALVE AND METER COMPANY

TUTE has established an office at Atlanta, Ga., and appointed Wm. H. Meth, district engineer . . . Ralph G. Caonette has been appointed general manager of the PITTSBURGH EQUITABLE METER division of ROCKWELL MFG. CO. . . . H. F. Wardwell is chairman of the board of DETROIT STEEL PRODUCTS CO., and W. C. Owen is now president. Wm. Gillett and E. C. Hodges were elected vice-presidents . . . William F. Foster has been appointed general manager of EVANS, COLEMAN & EVANS, LTD., building supply dealers and quarry operators of Vancouver, B. C., according to announcement of E. Roland Gilley, vice-president and managing director.

Deceased—Chas. H. Longfield, 56, vice-president of the YOUNGSTOWN SHEET and TUBE CO., Youngstown, Ohio, died in Clearwater, Fla., March 7 . . . Walter R. Howell, 60, president of the BLISS AND LAUGHLIN STEEL CO., Harvey, Ill., died in Chicago, March 14 . . . Walden W. Paape, 48, domestic sales manager of EUCLID ROAD MACHINERY CO. died March 18 in Cleveland, Ohio . . . Roy R. Summerville, assistant director of the Birmingham, Ala., plant of the SOUTHERN STATES IRON ROOFING CO., died March 7 . . . David P. Hopkins, associated with the U. S. PIPE & FOUNDRY CO., Burlington, N. J., and one of its predecessor companies for 54 years, died recently. He had retired in 1943 as vice-president in charge of operations and a director . . . Elmore H. Schiemann, 48, engineer with PIONEER SERVICE & ENGINEERING CO., Chicago, for many years, died Feb. 11 . . . John M. Jerpe, 58, director of the suggestion plan organization for GENERAL MOTORS, died at Indianapolis, Ind., March 10.

Miscellany—A 10 to 15-percent reduction in the price of corkboard has been announced by ARMSTRONG CORK CO., Lancaster, Pa. . . . TIMBER STRUCTURES, INC., of Portland, Ore., has moved its Seattle division office and warehouse to 2601 So. 98th St. . . . As a result of his recent 12,000-mile tour of the East and Midwest, Newman L. Smith, president of AIRQUIPMENT AND AEROL CO., INC., of Burbank, Calif., has announced a change in the method by which the companies' ground handling and materials handling equipment will be distributed. Seven market centers are being set up to give dealers in all areas 24-hour service on orders. Regional offices and warehouses have already been established in New York, Chicago and Cleveland. Four other cities will be added soon. . . . AVERY PRODUCTS CO. has been formed by three

(*Continued on page 113*)

PROFITS are greater on MECHANIZED PAVING JOBS!

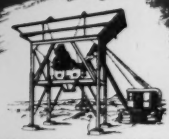
Start your savings with

BLAW-KNOX
CLAMSHELL BUCKETS

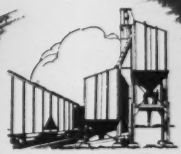
HERE'S how to make more money on each paving job by using Blaw-Knox "assembly line" equipment . . . first, start increasing your savings with Blaw-Knox Clamshell Buckets . . . then continue to make more money by *saving* it through 100% mechanization of every operation. Use Blaw-Knox equipment right down the line, from rehandling material to finished pavement. Blaw-Knox supplies *everything you need* for high speed, low cost concrete and black top paving or concrete construction.

And remember, when your job starts with Clamshell Buckets, whether it is rehandling, trenching, dredging or hard digging, it will pay you to use the best bucket available . . . the one that brings you the greatest return on your crane investment. Be sure to select the *right* bucket for the job . . . check *crane capacity, clearances, type of material* to be handled or work to be done . . . then choose the *type, size* and *weight* of bucket that will pay off in maximum yardage, easier, faster work and reduced over-all maintenance costs.

Blaw-Knox can best give you the engineering service that makes correct bucket selection simple, and offers you the one-source—one-responsibility mechanized equipment that makes possible greater profit on every job. See your nearest Blaw-Knox distributor, or write direct for literature.



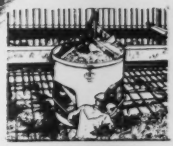
PORTABLE AGGREGATE BATCHING PLANTS



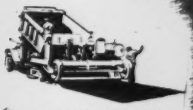
PORTABLE BULK CEMENT PLANTS

TRUCK MIXER LOADING PLANTS

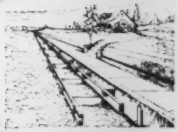
PRECISION SUBGRADERS



CONCRETE BUCKETS

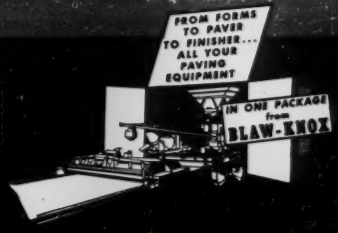


ADNUN BLACK TOP PAVERS



STEEL STREET FORMS

TRUCK MIXERS



BLAW-KNOX

BLAW-KNOX DIVISION OF BLAW-KNOX CO., Farmers Bank Bldg., Pittsburgh 22, Pa.

New York • Chicago • Philadelphia • Birmingham • Washington

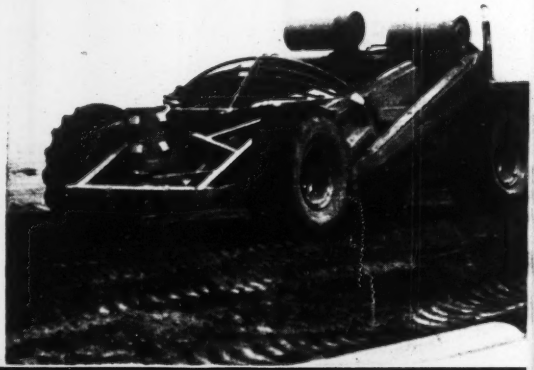
New "C" TOURNAPULLS

In Illinois

Sager Construction Company used two of these new electric-control Tournapulls to move 125,000 yards of earth on the Jacksonville Airport. Working in loamy top soil and clay on a 1600' one-way haul, each machine maintained an average of 11 loads an hour. Says job superintendent Steinhoff, "They make 2 trips to a crawler tractor's one". Sager Construction Company have ordered 2 additional C Tournapulls.

In Minnesota

McLean-Astleford Company put into production three of the high-speed (17.5 m.p.h.) Tournapulls on a 45-day contract to move 40,000 yards of sand for an addition to Ft. Snelling National Cemetery. The new Tournapulls completed a 2800' round trip cycle every 4½ minutes. Big 21.00 x 25 ground-gripping tires helped units travel through the deep, loose sand and permitted them to cross pavements safely without need of planking. McLean-Astleford moved 75% of their total yardage in the first 8 days!



LETOURNEAU
PEORIA, ILLINOIS

HIGH-SPEED RUBBER-TIRED

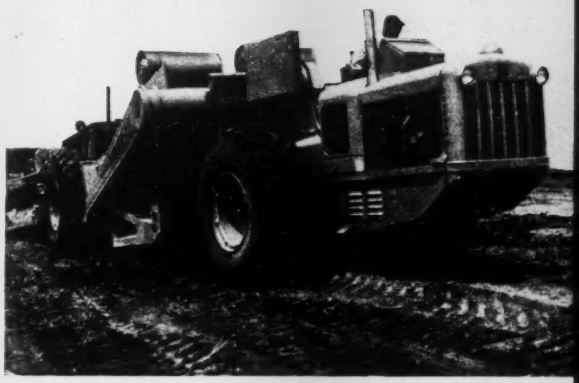
TOURNAPULLS

MORE YARDS PER HOUR WITH RUBBER-TIRED POWER

prove SPEED PAYS on any haul

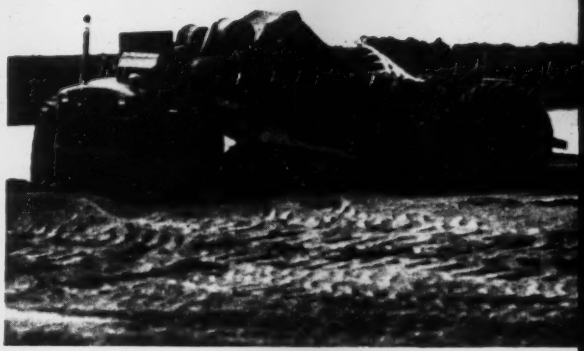
In Tennessee

B. G. Young & Sons brought two of the new C Tournapulls to the Greeneville Airport, helped move 130,000 yards on 30-day schedule. On 700' one-way hauls over 6% grades, these units each averaged 15 trips per hour with average pay load of 10 cubic yards. Finger-tip electric controls and instantaneous gear selection for constant power were especially important in getting this high production on short hauls. Giant 21.00 x 25 tires helped compact material, permitted haul over runways and over paved areas.



In Wisconsin

John O'Keefe used 2 of the new rubber-tired C Tournapulls with 3 of the earlier Super C Tournapulls to help speed completion of a Mississippi bridge approach on U. S. Highway 12 near Hudson. These fast-moving new C's loaded 11 pay yards of the loose blow sand in 75', averaged 10 trips per hour on a difficult 5000' cycle to average 110 pay yards per hour. The power steering and big air-controlled disc brakes permitted full use of high speed on steep haul grades (up to 12%). "Beat anything built", said Bob O'Keefe.



In Ohio

Kent Brothers have used two new C Tournapulls for road construction since spring of '48. After finishing a job at Laurelville, they drove 84 miles in 5 hours to a new job at Renrock. There they handled a 10,000-yard bridge approach on Highway 76. They then drove to a relocation of 78, between McConnelsville and Caldwell where they moved 70,463 yards of sandy loam, clay and soapstone shale over average 2000' hauls. Through the entire season, wet weather never shut them down. "Incomparable", commented Paul F. Kent, owner.

These are just a few of many job reports available, showing the *new* lowest-net-cost-per-yard available with LeTourneau electric-control Tournapulls. Would you like to see others? If so, contact your nearest LeTourneau Distributor . . . or send coupon for extra copies available.

Mail Today

R. G. LeTOURNEAU, Inc., Peoria, Ill.

☐ Please send us extra copies of Tournapull job performance reports on ..... haul length.

☐ Also send illustrated catalog explaining performance features of revolutionary "C" Tournapull.

NAME ..... TITLE .....

COMPANY .....

ADDRESS .....

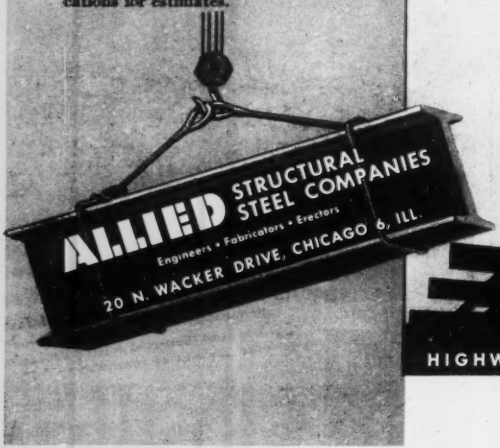
CITY ..... STATE .....

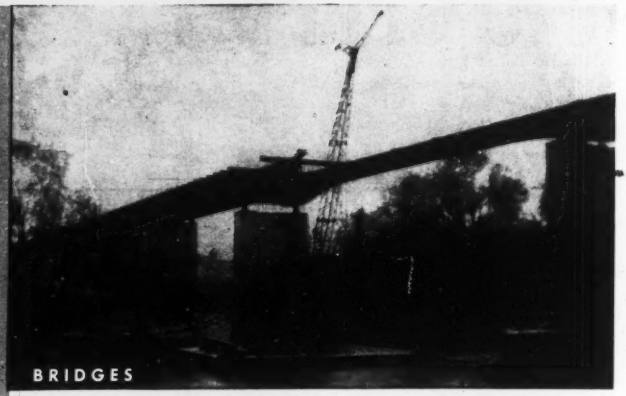
Type and quantity of dirtmoving involved .....

Tournapull—Trademark Reg. U. S. Pat. Off. EX59-w

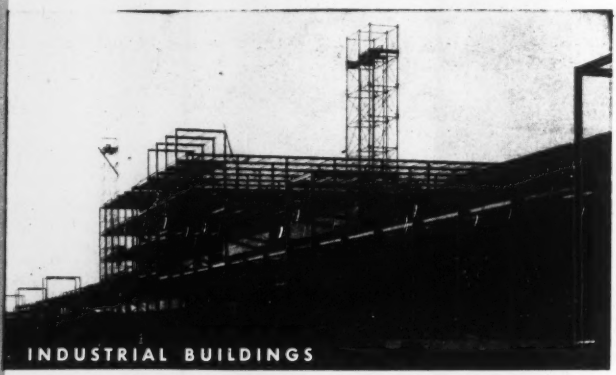
Fabricators and Erectors of *Structural Steel*

• Statistics show the steel industry has facilities to fabricate and erect over two million tons of steel in 1949. America finds Allied ready with *three* fully equipped plants, operating under unified control, with abundant capacity to tackle a big share of the job. Here expert crews fabricate and erect bridges and buildings from the blueprint stage to finished structures. We invite you to consult Allied on any structural job that's pending . . . large or small. Send us your specifications for estimates.

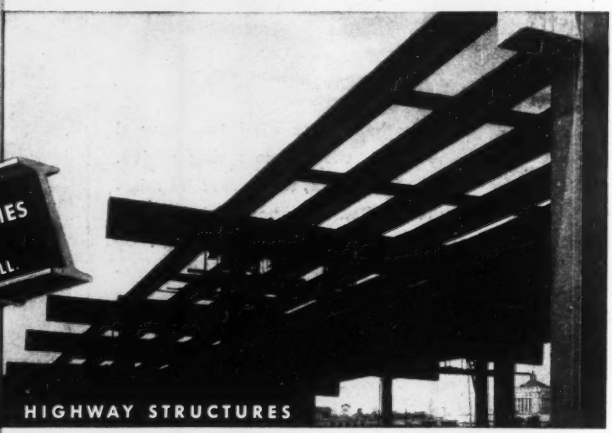




Allied engineers adapt methods to the job, often employing water erection with floating equipment to shorten bridge-building hours.



Similar equipment in each of Allied's three plants speeded up fabrication of structurals for this giant industrial plant.



3250 Tons of steel were fabricated by Allied for this California highway bridge . . . erected according to Allied's precision method.

associates of the AVERY ENGINEERING Co., Cleveland, Ohio, to merchandise packaged products in the air conditioning, refrigerating and ventilating field. AVERY ENGINEERING will continue to handle installation work. The firm sells Philco room coolers, Westinghouse fans and water coolers, Air Guard window ventilators, and Ingersoll Koolshades and Sun Screens. Offices will be at 1910 Euclid Ave., Cleveland . . . LINK-BELT CO., manufacturer of chain, power transmission and conveying machinery, to take care of an increased volume of business, has moved its Spokane, Wash., warehouse and district sales office to entirely new, larger and more convenient quarters at North 1303 Washington St., Spokane 13 . . . Representatives from each of the HURON PORTLAND CEMENT CO.'s 12 plants recently attended a 3-day company convention at Alpena, Mich. . . . Bailey Meter Co., Cleveland, Ohio, has announced another large expansion of its staff of field engineers. New field engineers are R. E. Byers, St. Louis; N. P. Campbell, San Francisco; G. F. Fitzpatrick, Denver; R. A. Homan, Pittsburgh; T. A. Melton, Charlotte, N. C.; W. G. Thiemann, New York; J. F. Kontz, Cleveland; G. H. West, Atlanta; N. S. Wilson, Philadelphia; M. G. Johnson, Houston; and R. P. Marche, Chicago.

Reintorcing steel group offers research prize

The Concrete Reinforcing Steel Institute announced establishment of an award to be given annually for noteworthy contributions to the advancement of reinforced concrete construction. A $500 cash award accompanied by a certificate of award will be presented for research contributing to the advancement of reinforced concrete, noteworthy contributions to the theory of reinforced concrete design, and for improvements to construction practices.

Any person, firm or corporation within the continental United States is eligible to compete for the first award, which will be made at the Institute's 25th anniversary meeting at White Sulphur Springs, W. Va., July 14-16. On the award committee is one representative from the American Concrete Institute, the American Society of Civil Engineers, and the Associated General Contractors of America.

Additional information on the award may be had from Harry Delzell, care of Concrete Reinforcing Steel Institute, 38 South Dearborn St., Chicago 3, Ill.

Picture shows a 4-yd Sauerman Scraper Machine, with traveling head tower, digging a basin 1250 ft. long and 360 ft. wide for a sewage plant. Output averaged 200 cu. yd. an hour, with the scraper bucket ranging back and forth across the excavation and dumping its loads into cars through a ramp attached to the front of the tower.

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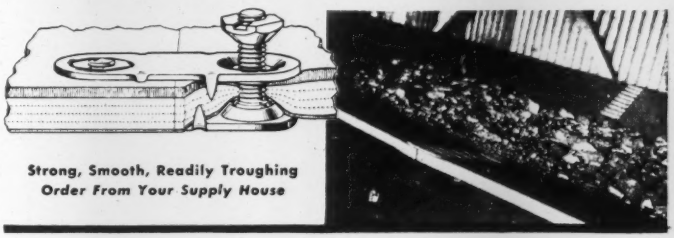

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Men and Jobs

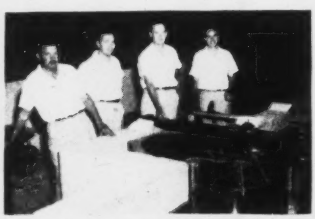
James J. Stabler, formerly chief engineer of The Connecticut Mutual Life Insurance Co., Hartford, Conn., has been promoted to buildings superintendent and officer of the company.

C. T. Murphy has been named director of the street department and public works for the city of Gulfport, Miss.

R. J. Brule of Navasota, Tex., has been made city engineer and manager of Harlingen, Tex. He succeeds **Alfred Tramm** as city engineer and **W. P. Briscoe** as city manager.

Lester D. Lee has been placed in executive charge by Hitchcock & Estabrook, Inc., consulting engineers and architects, Minneapolis, Minn. He is a graduate of Ohio Northern University and spent fifteen years on the staff of the city engineer in Milwaukee, Wis.

Col. John P. Buehler has gone to Portland, Ore., to become executive officer to Col. Theron D. Weaver, North Pacific division engineer, Corps of Engineers. He succeeds **Col. William Whipple**, now head of the Walla Walla district. Colonel Buehler's last previous assignment was to the civil affairs division's economic and supply branch at Washington, D.C. During the war he served in the New Guinea, South Philippines, Luzon and Ryukyus campaigns. He was graduated from West Point in 1934. At Massachusetts Institute of Technology he received his master's degree in civil engineering.



Engineers of the Waterways Experiment Station, Vicksburg, Miss., running tests on a 1:20 scale model of the Algiers Lock, now under construction on the Intracoastal Canal south of New Orleans are, left to right, John W. Bolin and Jack H. Ables, engineers; Thomas E. Murphy, chief of the structures section; and Fred R. Brown, chief of the hydrodynamics branch of the experiment station.

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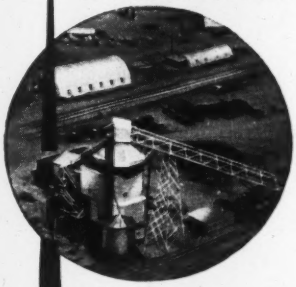

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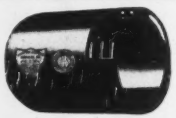

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Robert K. Horton has been appointed a sanitary engineer on the staff of the Ohio River Valley Water Sanitation Commission, the new regulatory agency that will aid states of the Ohio River Basin in stream clean-up programs. Mr. Horton, who is a 1938 University of North Carolina graduate, goes to the commission after six years service in South and Central America where he directed sanitation programs sponsored by the U. S. government through its Institute of Inter-American Affairs. During four years he was a commissioned officer of the Sanitary Corps of the U. S. Army, from which he was honorably discharged with the rank of lieutenant-colonel. Before that, Mr. Horton was a research fellow on stream pollution at the University of North Carolina. From 1938 to 1940 he was employed by the Textile foundation of Washington, D. C., to conduct research on industrial waste treatment methods.

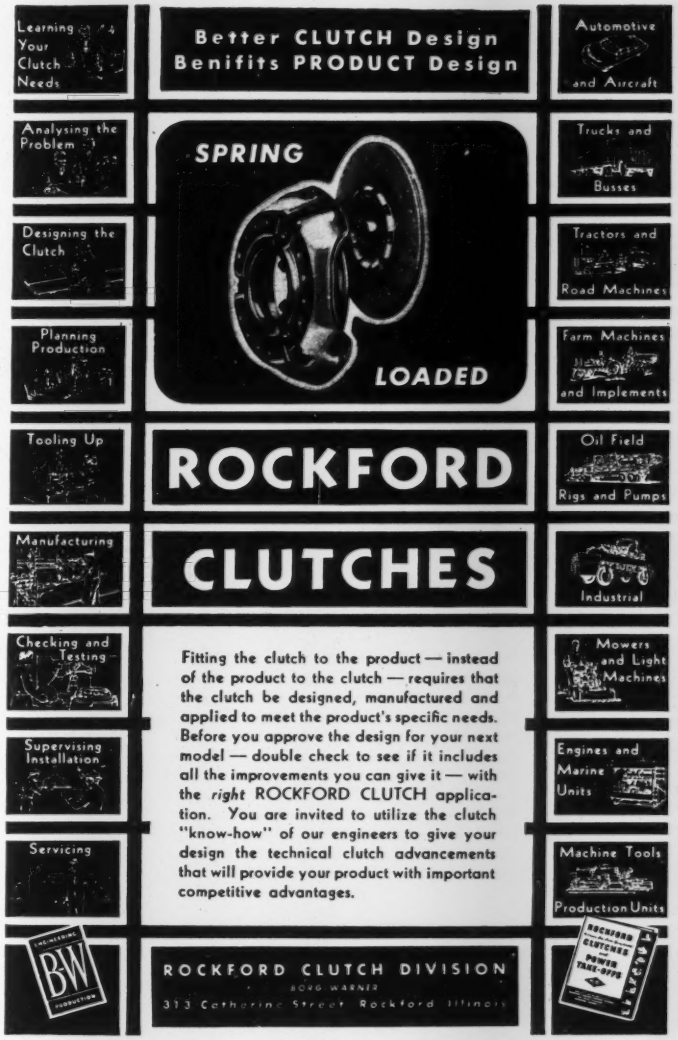
Bruce L. Wilson has been appointed chief of the engineering mechanics section of the National Bureau of Standards. He will direct research on structural elements and metal structures to determine their strength, deformation under load, and other mechanical properties, and will correlate the results with the theory of elastic and inelastic behavior of materials. He also will conduct research on special apparatus and methors for measuring forces, deformations and hardness, and on methods for calibrating such equipment.

Gen. Philip G. Bruton, retired division engineer with the Pacific Coast division, Corps of Engineers, has come out of retirement to join Miller, Ames and Mason, insurance brokers of San Francisco and Los Angeles.

A. E. Stewardson has been named city engineer of New Westminster, B. C., succeeding **R. E. Potter.**

Kent S. Ehrman has been appointed by the Bureau of Reclamation to direct the location and design of 400 miles of main canals, 2,000 miles of laterals and thousands of irrigation structures in the canal system for the Columbia Basin project. A 1933 graduate of Colorado College, he joined the chief engineer's office at Denver in 1933 and most recently has been stationed at Bend, Ore.

Morton L. Laslie, Dover, Ohio, has been named chief of the civil engineers in the Muskingum Conservancy District and will have charge of the district's 14 flood control dams in Ohio. He succeeds **C. E. Fulmer**, transferred to the U. S. Army engineer's office in Huntington, W. Va.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Elections and Activities

The Engineers and Architects Club of Louisville, Ky., has elected F. Clarke Dugan, chief engineer for the State Board of Health, president. Other officers are Gordon Beasley, vice-president and Charles E. Breitbeil secretary. Directors are Maurice L. Miller, retiring president; F. F. Schrader, Walter Fusick, Allan Cook, John F. Mayrose, and Fred H. Elswick.

The Washington, D. C., Society of Engineers has elected these life members: William W. Burrell, C. L. Garner, C. A. Peterson, Clegge Thomas, and Charles H. Tompkins.

W. T. Potter has resigned as president of the Carolinas branch of the A.G.C. His successor is E. D. Sloan.

The Kentucky Society of Professional Engineers has elected: H. A. Spalding, president; John Bitterman and O. L. Deep, vice-presidents; C. S. Crouse, secretary-treasurer; and as directors, Marion Ross, C. P. Hazelett, G. R. Watkins and J. V. Proctor.

Prof. J. M. Faircloth, head of the department of civil engineering at the University of Alabama, has been elected president of the Alabama Section of A.S.C.E. He succeeds Walter Schielke, Virginia Bridge Co. Other officers elected are: Arthur N. Beck, director, Bureau of Sanitation, State Board of Health, Montgomery, vice-president; J. B. Converse, of J. B. Converse Engineering Co., Inc., Mobile, second vice-president; Warren Keith, professor, School of Engineering, University of Alabama, and C. P. Willoughby, secretary and treasurer.

North Carolina section of the American Society of Civil Engineers has elected John D. Watson, president; B. W. Davis and Col. J. Norman Pease, vice-presidents; and George H. Maurice, secretary and treasurer.

G. W. May has been elected president of the Arkansas Chapter AGC; S. M. Dixon, 1st vice-president; M. O. Branton, 2d vice-president; and Ray Metzger, secretary-treasurer.

Detroit chapter, Associated General Contractors, has elected W. R. Bryant president. Other officers: C. H. Richert, first vice-president; B. B.

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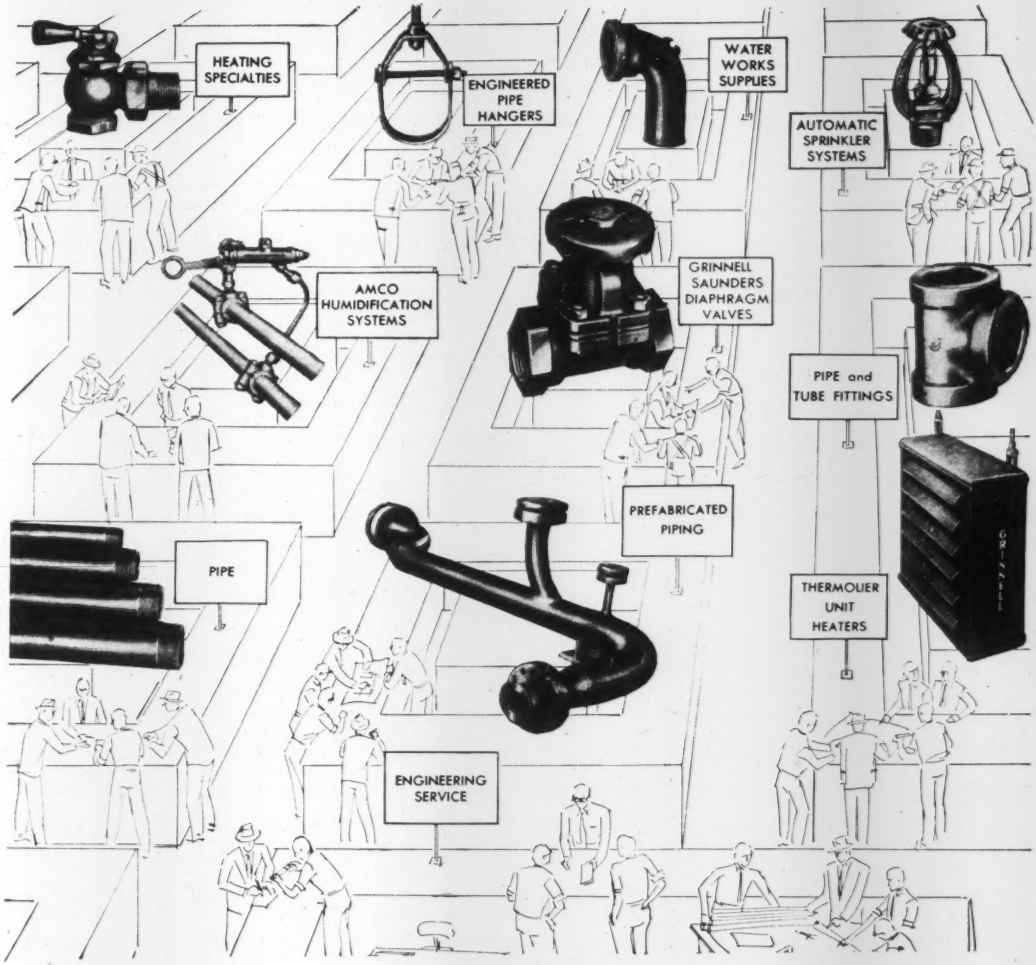

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Jackson, second vice-president; Glenn Lamont, treasurer; and L. M. Denton and R. E. Pickett, directors. Continuing as secretary-manager is Ralph A. MacMullan.

Engineers and architects of Georgia have formed the Engineers and Architects Council of Georgia. Eugene W. O'Brien was elected president. Other officers are: Cherry Emerson, vice-president, and George N. Normancy, secretary-treasurer.

E. D. Sloan, elected president of the Carolinas branch, Associated General Contractors of America, Inc. He succeeds W. T. Potter, resigned. Other officers: N. K. Dickerson vice-president; C. P. Stret, treasurer, and Robert Patten executive secretary.

The Massachusetts Public Building Commission recently elected Alan J. Potter, president; Ernest A. Johnson, Frank W. Crimp, Irving B. Parkhurst, and Frederick Guffey vice-presidents, and John A. Chambers, secretary.

Charles Nourse is the new president of the Building Contractors Association of Indianapolis, Ind., succeeding Louis W. Brandt. Vice-presidents are Arthur Vehling and F. A. Wilhelm, secretary-treasurer, Ralph Iula, executive secretary, C. O. Holmes, assisted by E. J. Ulmer, who also has charge of the association's apprentice training program.

Milton Rosen, commissioner of public works of St. Paul, Minn., has been re-elected president of the Minnesota Good Roads Association. Directors are: Wayne Peterson, S. S. Daniels, M. C. Zenner, and John Dieseth.

MAJOR MEETINGS

American Society of Civil Engineers, Biltmore Hotel, Oklahoma City, Okla., April 20-23.

American Geophysical Union, U. S. National Museum and National Academy of Sciences Auditorium, Washington, D. C., April 20-22.

American Wood Preservers Association, Jefferson Hotel, St. Louis, Mo., April 26-28.

First International Civil Engineering Congress, Mexico City, Mexico, April 30-May 7.

American Road Builders' Assn., Southeastern States Conference, General Oglethorpe Hotel, Savannah, Ga., May 11-13.

Society for Experimental Stress Analysis, Hotel Statler, Detroit, Mich., May 19-21.

American Water Works Association, Stevens Hotel, Chicago, Ill., May 30-June 3.

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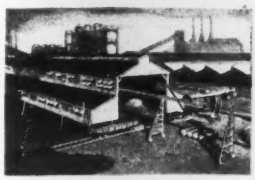

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New Engineering Books

(Continued from page 80)

TABLES OF BESSEL FUNCTIONS OF FRACTIONAL ORDER—Vol. II—Prepared by The Computation Laboratory of the National Applied Mathematics Laboratories, National Bureau of Standards. 365 pp. Columbia University Press, New York. $10.

THEORY OF OSCILLATION—By A. A. Andronow and C. E. Chaikin. 358 pp. Princeton University Press, Princeton, N. J. $6.

FLUID MECHANICS—Second Edition. By R. C. Binder. 361 pp. Prentice-Hall, Inc., New York 11. $5.65.

BEVEL ANGLES FOR THREE DIMENSIONAL CONNECTIONS—By Frank L. Martindale. 62 pp. Frank L. Martindale, Philadelphia, Pa. $7.50.

MODERN TIMBER ENGINEERING—Third Edition—By W. Fleming Scofield and W. H. O'Brien. 147 pp. Southern Pine Association, New Orleans, La. $1.50.

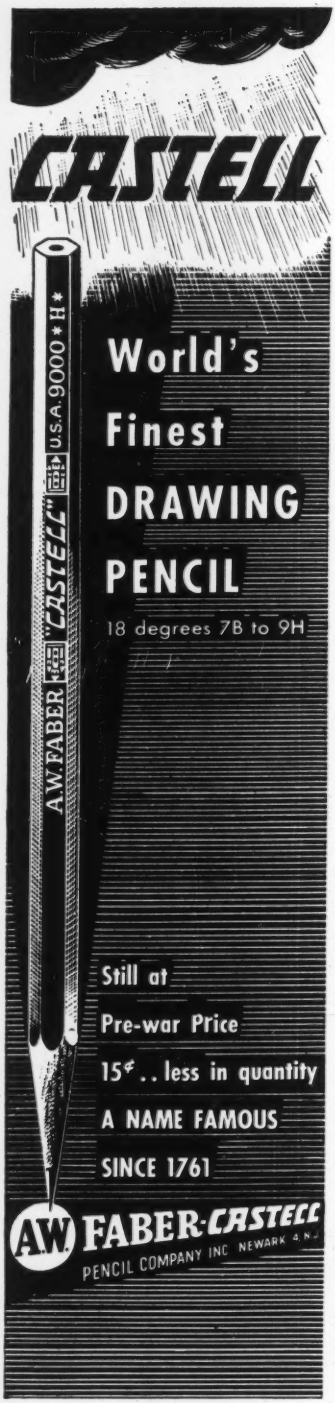
THE SCIENCE AND ENGINEERING OF NUCLEAR POWER—Vol. II—Edited by Clark Goodman. 317 pp. Addison-Wesley Press, Cambridge, Mass. $7.50.

Miscellaneous Notes on Booklets and Reprints

"PLANNING Garbage and Refuse Facilities for the Small Community," is the title of a booklet recently published by the Tennessee Planning Commission, Knoxville, Tenn. The booklet, which is a sound instructive guide for public-works managers with little experience in this field, describes all phases of refuse collection and disposal, analyzes advantages and disadvantages of disposal methods and includes copies of suggested and in-use refuse-disposal ordinances. The booklet may be obtained from the commission for $1.

PUBLICATION of a "Light Gage Steel Design Manual" by the American Iron and Steel Institute is an important landmark in the development of this type of construction. Supplementing the "Specification for the Design of Light Gage Steel Structural Members," the manual presents design charts and structural properties of cold-formed basic sections for steel sheet or strip of thicknesses from 0.135 to 0.048 in., with nominal gages from 10 to 18. These data will greatly simplify design calculations and will tend to encourage the trend toward light-gage structures. The 77-page booklet can be obtained for $1 from the AISI, 350 Fifth Avenue, New York 1, N. Y.

A REPORT ON WATER-TIGHTNESS of structural-clay facing tile walls has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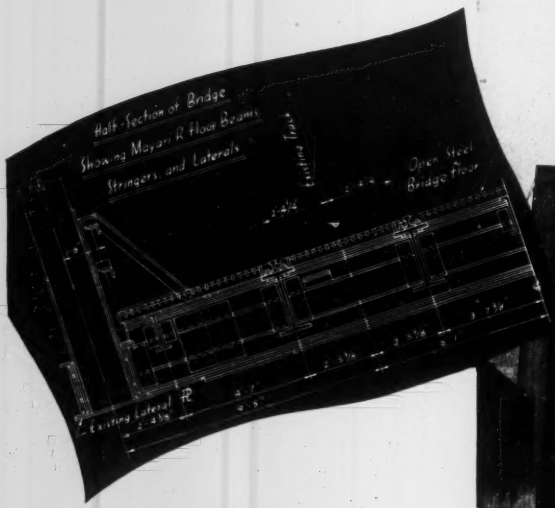

Drawing showing half-section of remodeled bridge with new floor members of Mayari R. Note how the track running-rails are bolted directly to stringers without use of timber ties.

Conemaugh and Black Lick Railroad bridge erected in 1906. Mayari R floor members were recently installed a panel at a time without disrupting traffic.

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been released by the Office of Technical Services of the Department of Commerce. In the study, made by the University of Minnesota in 1947, samples of various types of tile wall sections were exposed to simulated wind and rain to determine the best methods of protection against wall leakage during prolonged exposure. Factors affecting the bond between tile and mortar were found to be more important than the nature of the exposed tile surface. Consequently, use of a dense, well-graded mortar applied in well-filled joints is recommended. The 35-page pamphlet, PB-94388, "Water Permeability of Structural Clay Tile Facing Walls," is available from the Office of Technical Services, Department of Commerce, Washington 25, D. C. at $1 per copy. Orders should be accompanied by check or money order payable to the Treasurer of the United States.

Reports and Pamphlets

DETERMINATION OF FACTORS AFFECTING LAMINATION IN STRUCTURAL CLAY PRODUCTS—Bulletin 164—By A. L. Johnson. The Director, Iowa Engineering Experiment Station, The Iowa State College, Ames, Iowa.

CAREERS IN ENGINEERING AND SCIENCE—A guidance booklet prepared by the Polytechnic Institute of Brooklyn, 99 Livingston St., Brooklyn 2, N. Y.

THE OUTLOOK FOR WOMEN IN ARCHITECTURE AND ENGINEERING—Bulletin of the Women's Bureau No. 223-5. For sale by the Superintendent of Documents, Washington 25, D. C. Price 25c.

THE APPRAISAL OF TERRAIN CONDITIONS FOR HIGHWAY ENGINEERING PURPOSES—Bulletin No. 13—Highway Research Board, Washington 25, D. C.

PROCEEDINGS OF THE OHIO HIGHWAY ENGINEERING CONFERENCE—Bulletin No. 134—Engineering Experiment Station, Ohio State University, Columbus, Ohio. $1.

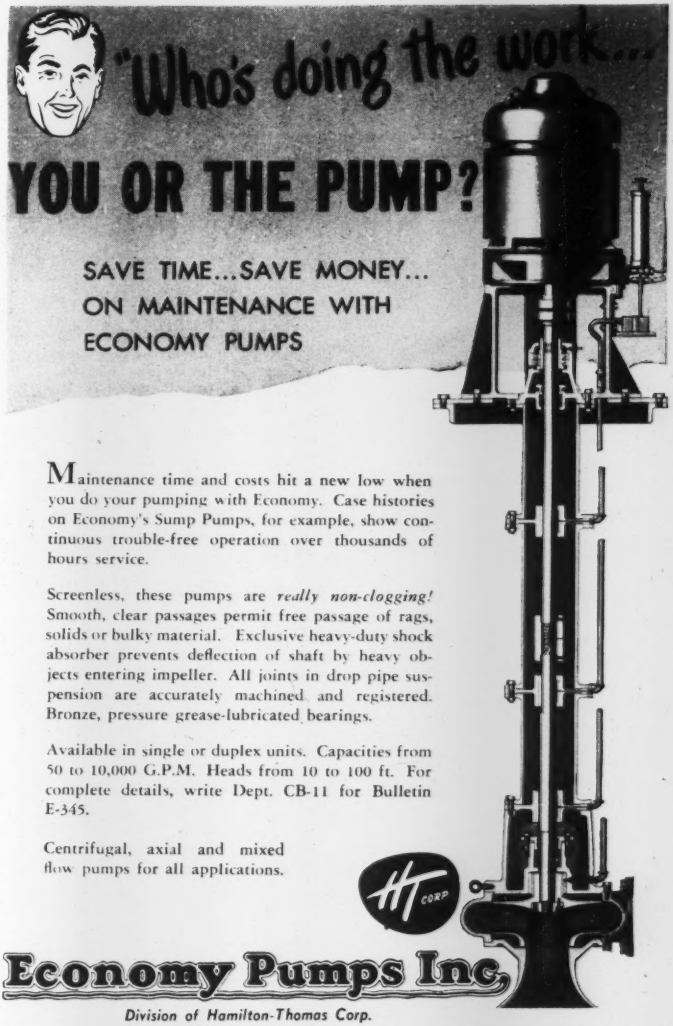
DOUGLAS FIR OF THE WESTERN PINE REGION — Western Pine Association, Yeon Building, Portland 4, Ore.

CALCULATING DEFLECTION OF CURVED BEAMS—By Kenneth E. Lfgren—Engineering and Science Series Number 31—Cooper Union Bulletin, The Cooper Union, New York 3, N. Y.

SOILS COMMITTEE REPORTS AND SPECIAL PAPERS—Bulletin No. 14. Highway Research Board, Washington 25, D. C.

VERMONT'S 1948 HIGHWAY NEEDS—Commissioner of Highways and Chief Engineer, Montpelier, Vermont.

ALUMINUM ALLOY CASTINGS—The Aluminum Association, 420 Lexington Ave., New York 17, N. Y. $.50.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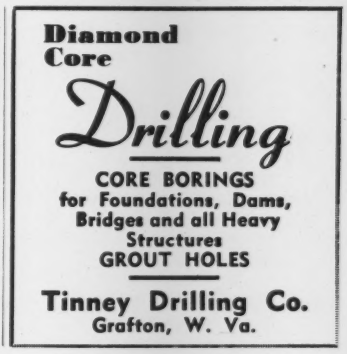

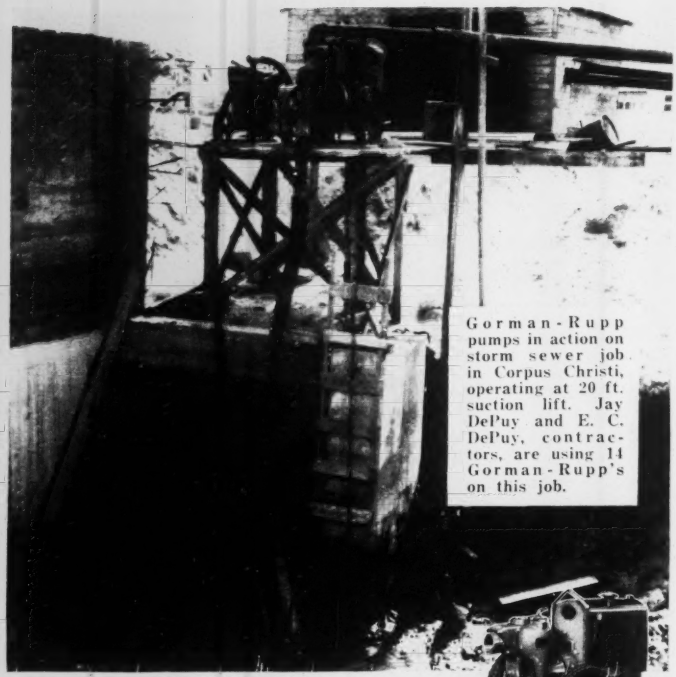

Gorman-Rupp pumps in action on storm sewer job in Corpus Christi, operating at 20 ft. suction lift. Jay DePuy and E. C. DePuy, contractors, are using 14 Gorman-Rupp's on this job.

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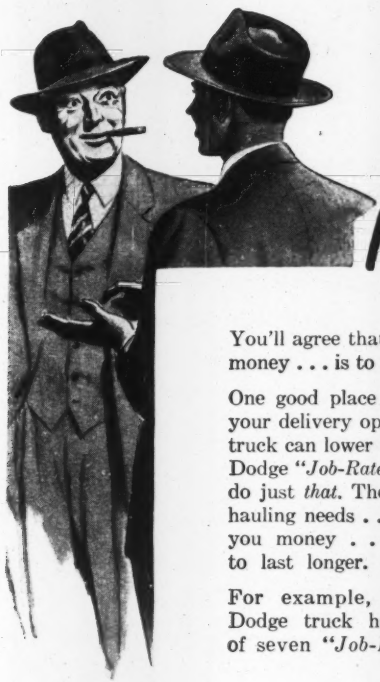
OBITUARY

Ralph Whiteley Berry, 69, civil engineer, topographic engineer and map editor for the United States Geological Survey for more than 45 years, died recently in Washington, D. C. A graduate in civil engineering from Vanderbilt University in 1901, Mr. Berry began work with the Geological Survey that same year. Except for a year with the Isthmian Canal Commission in Panama in 1905, two years in the Army as an Engineer Corps captain during World War I and several years as a private surveyor in the 1930's, Mr. Berry remained with the bureau until his death. One of the more topographically intricate problems Mr. Berry worked on was a relief map of the Mesa Verde National Park in Colorado. He received a meritorious service award from the Interior Department for work on Pacific Island relief maps, especially one of Japan, done for the United States Army.

Irving C. Hess, 68, engineer for the California Water & Telephone Co.'s San Diego Bay division, San Diego, Calif., died recently. He was a pioneer in railroad engineering and surveying, having moved to California in 1903 to work for the Southern Railway Co. Mr. Hess joined the California Water & Telephone Co. in 1936 at Monterey, where he was division engineer. He started with the Baltimore & Ohio Railway. After 3 years of working with California railways, he studied a year at Stanford University and then went to Bolivia with B. & O. engineers to make surveys for the Bolivian National Railways. On returning to this country he worked for lumber railroads, for the Oroville-Wyandotte Irrigation District in Butte County and the Pacific Palisades Association. He was a graduate of Baltimore Polytechnic Institute.

John Bernard Hawley, division construction engineer for the Tennessee Department of Highways & Public Works died recently. He had served for a longer period than any other man in a similar position with the department. Prior to his service with the department he was connected for a long period with the Bureau of Public Roads (now the Public Roads Administration).

Orville W. Jenkins, 65, Michigan builder and engineer, died recently. He built the Saginaw General Hospital and a number of school buildings in that area before going to Detroit,



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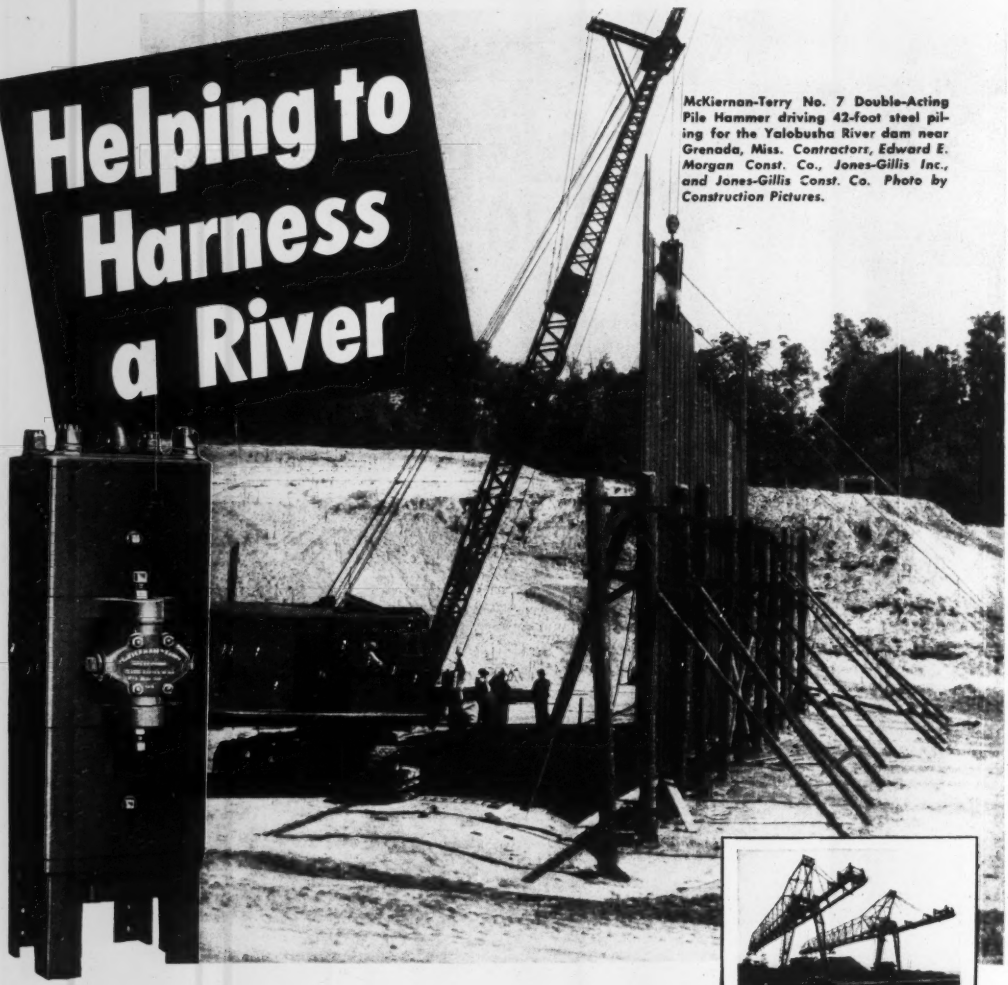

McKiernan-Terry No. 7 Double-Acting Pile Hammer driving 42-foot steel piling for the Yalobusha River dam near Grenada, Miss. Contractors, Edward E. Morgan Const. Co., Jones-Gillis Inc., and Jones-Gillis Const. Co. Photo by Construction Pictures.

The Grenada Dam, part of a wide flood control plan for the Yazoo River Basin, is an earth dam with a concrete spillway. A McKiernan-Terry Pile Hammer was chosen to drive the necessary steel piling . . . another tribute added to those being constantly paid by contractors to the dependability of McKiernan-Terry Pile-Driving Equipment.

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where he erected several large housing projects.

Clyde B. Asher, 65, Washington, D.C. construction engineer, died there recently. Mr. Asher went to Washington in 1909 shortly after graduation from Ohio State University where he received a B.S. degree in engineering. He was in the construction business in the Washington area until his retirement in 1940.

E. Russell Davis, 58, active in community affairs at Sidney, N. Y., and since 1946 city engineer of Norwich, N. Y., died recently. He was a 1913 graduate of the college of engineering at Cornell University. At one time he was city engineer of Newport News, Va., and later was with the U. S. Gypsum Co., as construction engineer and supervisor in building its plants at Staten Island, N. Y. City, Canaan, Conn., and Philadelphia, Pa.

Charles A. S. Howlett, 76, a retired professional engineer of Collingswood, N. J., died recently. He was a former teacher at the College of South Jersey.

N. T. Binks, 61, consulting engineer, of Montreal, Que., died there March 7. A graduate of McGill University, he served with the Royal Canadian Engineers in the first world war.

Donald W. Herndon, 42, soil cement engineer for the Portland Cement Association, died at Daytona Beach, Fla., March 3. A graduate of the University of Missouri, 1931, he formerly was an engineer for the Missouri highway department.

William J. Chisholm, 71, civil engineer, died at Antigonish, N. S., March 3. For many years, he was in rail and road construction in the western provinces, then returned east to become active in road construction in Nova Scotia.

James Bartlett O'Brien, superintendent of King Paving Co. Ltd., Toronto and Oakville, Ont., and for the last 40 years an outstanding figure in the highway construction business, died March 8.

Harrison W. Fitzgerald, 76, a Buffalo, N. Y., engineer whose work took him to all parts of the United States and Russia, died March 9 at his home in Hamburg, N. Y. He was with the Armco Steel Co. of Chicago. He worked for the Bethlehem Steel Co. in Buffalo for 25 years before leaving in the 1930's to work abroad for the Freyn Engineering Co. He spent two years there and on his return to this

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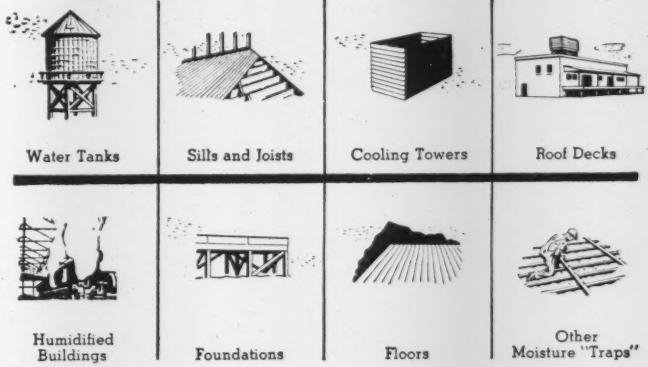

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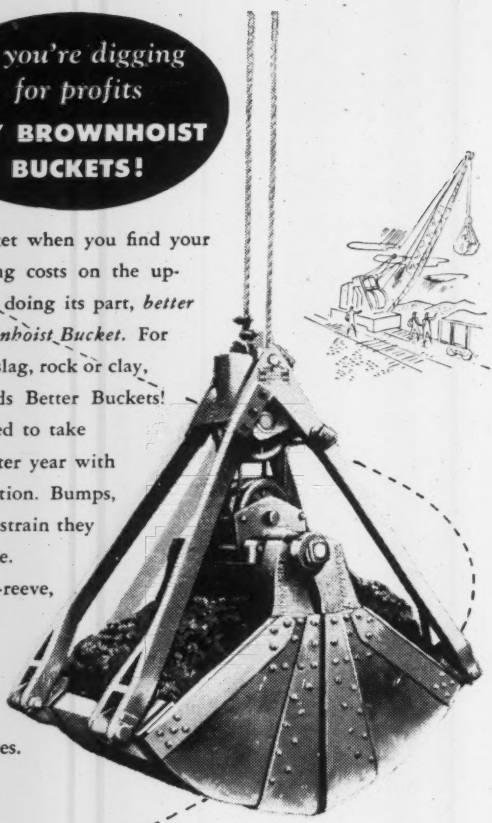

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country joined the United Engineering Co. of Chicago.

Edward M. DeMunn, 75, former superintendent of public works at Geneseo, N. Y., died in his home there March 8.

Chester E. Albright, 88, who was president of the Philadelphia consulting engineering firm of Albright & Friel, Inc., until his retirement in 1945, died in Philadelphia on March 29. He was graduated from Lafayette College in 1883. In 1890 he established an office in Philadelphia for consulting engineering. In 1904 Albright & Mebus was founded. It continued in consulting practice until 1931 when the present firm of Albright & Friel, Inc., was organized. From 1916 to 1920, Mr. Albright was chief engineer of the bureau of engineering and surveys of Philadelphia. He was in continuous private practice for 55 years, serving many clients throughout the United States, and his engineering activities extended as far as the Dominion of Canada, England and Argentina.

G. Otis Wright, 66, of East Cleveland, Ohio, for more than 35 years a consulting engineer in steel construction and design, died in St. Petersburg, Fla., March 24.

Arthur Gaudin, 70, a contractor who built many large buildings in Montreal, Que., died there March 23. He was said to have been the first in Montreal to use reinforced concrete in construction.

Sumpter Lea Harwood, 73, city engineer of Uniontown, Ala., for 39 years, died recently. He was a graduate of Alabama Polytechnic Institute, Auburn, Ala., and Cornell University, Ithaca, N. Y.

Alvin E. Lynn, 63, superintendent of the works department of Frankfort, Ky., and a city employee for the last 40 years, died March 22.

Ira Payne Jones, Sr., 54, construction engineer for C. B. Kelley and Co., contractors, died March 30 in Nashville, Tenn. He attended Vanderbilt University and was graduated from Massachusetts Institute of Technology. He had been employed as construction engineer for C. B. Kelley Co. for the last 12 years, and had formerly been employed with the Kirkpatrick Lumber Co. for about 10 years. A veteran of both world wars, Mr. Jones served in World War II for four years as captain in the Engineering Corps.

"FLEETWELDERS" ELIMINATE ARC BLOW ...increase welding speed 10%

By J. K. GANNETT
Vice President in charge of Engineering and Research, The Austin Company, Cleveland, Ohio

J. K. Gannett

The solid, uniform welds required in our heavy structural work are now being made easier and at lower cost with AC arc welding. By eliminating the restrictions of arc blow in the construction of heavy structural weldments like the roof truss shown, our fabricating shop is today able to take full advantage of higher welding currents with resulting substantial increases in welding speeds.

Structural members like the jack truss shown in the photographs are shop fabricated from wide flange beams and from plate. Component members are first positioned accurately for close fit-up and tack welded. One side is then partially welded with fillets of ¼" "Fleetweld 7" electrode using 500-amp. Lincoln "Fleetwelder" AC arc welders.

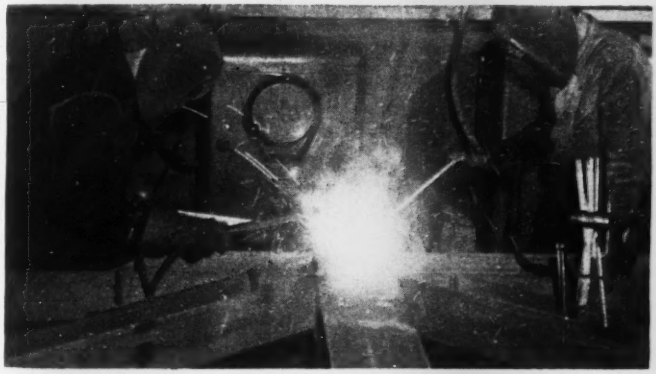

Fig. 1. *Arc welding diagonals to chord with the 500-amp. Lincoln "Fleetwelder" AC welders at the structural fabrication shop of The Austin Company.*

After the initial side welds are made, the truss is placed in an upright position as shown in Fig. 2 and continuous welds completed around each member, framing into the lower chord. The truss is then flopped over and similar welding is done for the members framing into the other chord. This procedure permits us to use fast downhand welding techniques on all connections and assures us solid, high quality welds on all joints at the lowest fabricating cost.

Using the AC "Fleetwelders," thus eliminating arc blow, allows our operators to increase their current to over 300 amperes with no difficulty in maintaining a steady, constant arc at all times. Increased amperage, combined with steady, uninterrupted operation, has cut our welding time about 10%.

Fig. 2. *Fabricating all-welded 40-ft. jack truss for factory building framework. Top and bottom chords are 10"-21WF beams; diagonals are 8"-17WF beams. Welds are downhand, single pass, ⅜" fillets.*

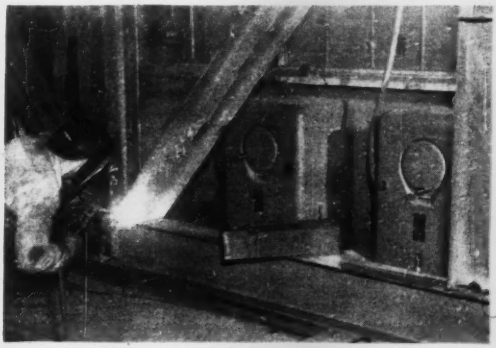

Fig. 3. *Finishing all-around welding of diagonal to bottom chord. Weld is made with single pass ¼" diameter "Fleetweld 7" electrode. Welding current is 310 amps.*

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For further information on "Fleetwelders," write for Bul. 366. The Lincoln Electric Company, Dept. 134, Cleveland 1, Ohio.

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WATER SUPPLY

●**Calif., Eureka** — City, City Hall. **$2,000,000** bond election June 20, water sys. imprvs., cost $1,000,000. Koebig & Koebig, Rowan Bldg., Los Angeles, consult. engr. CD 9/8/44—ENR 9/21/44.

Miss., Laurel—City, Carrol Gartin, mayor, City Hall, **$250,000,** bond election April 5, 10 mi. watermains and 500,000 gal. reservoir. CD 5/25/45—ENR 5/31/45.

N. C., Sylva—Town, Jack C. Allison, mayor, Sylva, bond election May 2, WW imprvs. **$150,000.** CD 12/1—ENR 1/6.

Okla., Ada—City, voted bonds, WW extens. **$590,000.** George Toler, Ada, consult. engr. CD 3/9.

Tex., Electra—City, T. Leo Moore, mayor, filter plant, **$70,000;** 10 in. c.i. pipelines. **$60,000.** Freese & Nichols, 410 Danciger Bldg., Fort Worth, consult. engrs.

Tex., Houston—Harris County Water Control & Imprvt. Dist. 11, c/o C. L. Henley, Greens Bayou, c/o Courthouse, Houston 6 and 8 in. watermains, **$100,000;** water supply well, **$30,000;** in Green Bayou area. Frank J. Metyko, Scanlan Bldg., consult. engr. CD 2/1—ENR 2/3.

Utah, Salt Lake City—Salt Lake City Water Dpt., c/o D. A. Affleck, comr. of WW. City and County Bldg., 48 in. either steel or concrete main water feed line from Park Reservoir to 17 South St. **$400,000-$500,000.** CD 5/24/44—ENR 6/1/44.

SEWERS, WASTE DISPOSAL

Ark., Arkadelphia—City, Arkadelphia, voted bonds, sewer line extens., **$185,000.** CD 7/9—ENR 8/19.

Ark., Jonesboro—City, exten. sewerage sys. **$100,000.** CD 9/1/43—ENR 9/9/43.

●**Ark., Little Rock**—City, storm sewers. **$2,-000,000.** Paul Zouder, City Hall, City engr. CD 11/5/45—ENR 11/29/45.

●**Ark., North Little Rock**—City, North Little Rock, sewerage diversion proj. in Dark Hollow area, Levy Ave. and 1 pumping station. **$1,497,000.** Kennedy Lefever Gazette Bldg., Little Rock, consult. engr.

●**Ark., Pine Bluff** — City, Pine Bluff, sanitary sewer sys. extens. and imprvs., Approx. **$1,000,-000.** A. E. Heagler, 315 Exchange Bldg., Little Rock, consult. engr. CD 6/23/47—ENR 7/10/47.

Calif., Elsinore—City, Elsinore, sewage disposal plant, force main, lifting station, **$122,000.** Francis H. Bulot, 411 S. St., Los Angeles, consult. engr. and D. R. Crane, 122 Graham Ave., Elsinore, city engr.

●**Calif., Eureka** — City, City Hall. **$2,000,000** bond election June 20 series of 3 sewage treatment plants, **$675,000** and replacement of existing sewer lines, $133,400. Koebig & Koebig, Rowan Bldg., Los Angeles, consult. engr. CD 9/9/48—ENR 9/30/48.

Calif., Los Angeles—Los Angeles Co., Bd. Supervs., 501 Hall of Records, sanitary sewer in San Dimas Ave., Arlington Ave. and Bonita Ave., 6.90 mi. 8 to 10 in. sewer pipe, San Dimas, **$147,000;** sanitary sewers in Norwood Pl. and other vicinity of Wilmar, incl. 3.62 mi. 8 in. vitr. clay pipe, **$77,750.** C. E. Arnold, co. surv. and engr.

Calif., Los Angeles — Bd. Supervs. Los Angeles Co., 501 Hall of Records, sanitary sewers in Emerson Pl., 2.9 mi. 8 in. sewers in Wilmor Dist., **$63,200;** sanitary sewers in Walnut St., 2.84 mi. 8 in. sewers in Bell Gardens Dist., C. I. 1245, **$58,100.** C. E. Arnold, co. engr. and surv.

Calif., Los Angeles—Bd. Supervs. Los Angeles Co., 501 Hall of Records, sanitary sewers in Holman Ave., Altadena, **$111,100;** sanitary sewers in Lotus and East Pasadena, **$144,400;** 170 St. Lawndale, C. I. 1296, **$50,000.** C. E. Arnold, co. engr. and surv.

Calif., Merced—City, City Hall, sewage disposal sys. **$220,000.** Harold F. Gray, 2740 Benvenue Ave., Berkeley, and G. E. Winston City Hall, engrs.

●**Calif., Santa Ana**—Orange Co. Sanitation Dists. 1, 2, 3, 5, 8, 9, and 11, 115 Church St., Santa Ana, voted **$8,308,000** bonds, primary sewage treatment plant incl. mechanical sludge and scum removal, multi-stage digester, sludge drying beds, chlorinator trunk sewers ranging in size from 12 to 90 in. in diam. and an ocean outfall 78 in. diam., 7,000 ft. in length. Vinton W. Bacon, c/o owner, engr.

Colo., Golden—City, City Hall, plans by Ripple & Howe, archts. and engrs., Cooper Bldg., Denver, sewage disposal plant, **$200,000.**

Conn., Norwalk—City, Municipal Offices, City Hall, sewage disposal plant addns. **$550,000.** Metcalf & Eddy, 1300 Statler Bldg., Boston, Mass., consult. engrs. CD 4/14/46—ENR 5/2/46.

Conn., Putnam—City, Mayor's office, City Hall, sewerage sys., incl. sewer main exten. to Wheaton Farm, **$200,000.** Gilbert C. Perry, City Hall, city engr.

●**Ga., Atlanta**—City, incinerator addn. **$1,-000,000.** Robert & Co. Assoc., 96 Poplar St., consult. engr. CD 8/16/46—ENR 9/5/46.

Idaho, Lewiston—City, City Hall, sewage treatment plant, trunk sewer, **$475,000.** Stevens & Koon, Spaulding Bldg., Portland, Ore., consult. engrs. W. P. Hughes, city engr. CD 5/9/47—ENR 5/29/47.

Ill., Swansea (Belleville P. O.)—Village, Village Hall, sanitary sewerage sys. Approx. **$100,000.** James G. Cooney, First National Bank Bldg., 19A N. Illinois St., Belleville, engrs. CD 3/4—ENR 3/17.

Ky., Maysville — City, City Hall, storm sewer line, **$125,000;** sanitary sewer lines, **$125,000.** W. F. Manion, 914 Main St., Cincinnati, O., consult. engr., CD 11/25/46—ENR 12/12/46.

La., Denham Springs—City, P. T. Jones, mayor, bond election, May 17, sanitary sewer imprvs. **$135,000.** Barnard & Burk, Triad Bldg., Baton Rouge, consult. engsr.

Mass., Lunenburg—Town, Bd. Selectmen, Town Hall, sewerage sys., treatment plant, Metcalf & Eddy, 1300 Statler Bldg., Boston, engrs.

Mass., Marblehead — Town of Marblehead, Bd. Selectmen, Town Hall, sewers and pumping station, Little Harbor, **$100,000.** Haley & Ward, 73 Tremont St., Boston, engrs. CD 1/22 47—ENR 2/6/47.

Minn., Mankato—City, T. Mackey, city engr., sewage disposal plant, **$750,000.** Toltz, King & Day, 1509 Pioneer Bldg., St. Paul, engrs.

Mo., Olivette (St. Louis, Zone 5, P. O.)—Olivette Sanitary Sewer Dist., c/o C. Willard Max, 8922 Forsyth, Clayton, St. Louis Zone 5, **$80,000** bond election Apr. 5, sanitary sewerage sys. **$133,825.**

●**Mo., St. Louis**—City, M. M. Kinsey, pres. Bd. P. Serv., City Hall, defeated **$15,000,000** bonds sewer rehabilitation and enlargement, Harlem Creek, northern part of city, and Baden and Glaise Creek Distrs. Projects indefinitely postponed. CD 2/4—ENR 2/15.

N. M., Raton—City, plans by Alfred J. Ryan, consult. engr. and archt., 1342 Glenarm Pl., Denver, Colo., sewerage treatment, primary and secondary. **$200,000.** CD 1/8/48—ENR 1/22/48.

N. Y., Brooklyn—President Brooklyn Boro, Boro Hall, storm and sanitary sewers, E. 29 St. from Voorhies Ave. to Avenue Z, Nostrand Ave. from Voorhies Ave. to Avenue Z, $70,500; combined sewer, Farragut Rd. from Ralph Ave. to E. 56 St.; East 56 St. M. Farragut Rd. to Avenue H; Avenue H from E. 56 to Paerdegat Ave. south; Glenwood Rd. from Paerdegat Ave. south to Ralph Ave.; sanitary sewer in Ralph Ave. west side from Glenwood to Farragut Rds. **$111,800.**

●**N. Y., New York**—President Manhattan Boro, Municipal Bldg., Zone 7, relocating Board of Transportation ducts and cables; constructing combined sewers in north side 1 Ave. from E. 43 rd to 51 St. and E. 48 St. from 1 Ave. to new street adjacent to Franklin D. Roosevelt Dr.; sanitary sewers in new street adjacent to Franklin D. Roosevelt Dr. from E. 48 to E. 49 Sts., and through public park adjacent to Franklin D. Roosevelt Dr. from E. 41 to E. 42 Sts. at point about 100 ft. west of Franklin D. Roosevelt Dr.; storm water overflow chamber and storm water outlet sewer in E. 42 St. from point about 100 ft. west of Franklin D. Roosevelt Dr. to the bulkhead; receiving basins where necessary, etc., included in Contr. 161-C, and comprising Sect. 2 of comprehensive improvement for constructing vehicular underpass with ramp approaches, complete in Tunnel Street in and under 1 Ave. from E. 41 to E. 48 Sts., etc. **$1,155,000.**

N. Y., Oneonta — Town, sewerage sys., treatment plant. Approx. **$170,000.**

N. Y., Thompsonville—Town, sewerage sys. and treatment plant for Kiamesha Lake Sewer Dist. and for Sackett Lake Sewer Dist. **$175,000** each. (**Correction**—location of project). CD 2/15.

N. C., Spindale—Town, bond election May 3, 4 mi. new lines, sewerage sys. imprvs. **$150,000.** CD 4/16/46.

O., Trenton—Village, Seecher Schooley, mayor, Trenton, sewage disposal plant and sys. **$150,000.** Ralph Woolpert Co., 360 W. 1 St., Dayton, consult. engr. CD 11/19—ENR 12/23.

Okla., West Nichols Hills (Oklahoma City P. O.)—West Nichols Hills, voted bonds sanitary sewer **$130,000.** Phillips & Strong, Insurance Bldg., Oklahoma City, consult. engrs.

Pa., McKeesport — City sewage disposal plant. Approx. **$500,000.** Tippetts, Abbett, 1708 Freemont St., consult. engr. CD 10/21/45—ENR 11/29/45.

Pa., Mt. Wolf—Mt. Wolf Boro, Mt. Wolf, sewage and disposal plant. **$235,000.** Thomas A. Monk, Jr., 30 S. Queen St., York, consult. engr.

R. I., Cranston — City, H. W. Lark, mayor, City Hall, sewers, extens. to print works and housing projects. **$600,000.**

R. I., East Providence—Town, C. C. Viall, clk., Town Hall, 16 in. sewer main extens., Taunton Ave. **$100,000.** Waterman Eng. Co., 86 Weybosset St., Providence, engr. CD 12/1/47—ENR 12/11/47.

Tex., Alvin—City, underground sys. of drainage. **$100,000.** S. A. Russell, Rosenburg, consult. engr.

Tex., Carthage—City, sanitary sewerage sys. imprvs., extens. **$100,000.** Royce E. Wisenbaker & Assoc., 1415 N. Bryce St., consult. engrs. CD 9/28/45—ENR 10/11/45.

Tex., San Antonio—City, Henry Hein, comr., incinerator and repairing existing one, **$300,-000.**

Wis., Durand—City, sewage treatment plant, **$200,000.** S. P. Hall, 128½ Graham Ave., Eau Claire, consult. engr. Approx.

Wis., Rice Lake—City, sewage treatment plant, **$350,000.** Davy Eng. Co., 502 Main St., LaCrosse, consult. engr.

BRIDGES

Arkansas—State Hy. Dpt., Little Rock.

Ashley Co.—paving Montrose Overpass approaches, Montrose, **$90,000.**

Carroll Co.—bridge over White River, Busch, **$200,000.**

Crawford Co.—widening 3 bridges on Hy. 64, Alma, **$105,000.**

Hot Springs Co.—constructing overpass, Malvern, **$341,000.**

Izard Co.—bridges between Calico Rock and Rockwell on Hy. 56, Calico Rock, **$135,000.**

Jefferson Co.—repairing bridge across Arkansas River, Pine Bluff, **$405,000.**

Lawrence Co.—bridge approaches 3½ mi. at Black Rock, **$282,000;** bridge across Spring River on Hy. 63, Ravendon, **$222,000.**

Lee Co.—4 bridges on Hy. 79 near Marianna, **$234,000.**

Lonoke Co.—bridges on Hy. 67 between Ward and Beebe, **$175,000;** bridges on Hy. 30, Humnoke, **$101,000.**

Miller Co.—Index Bridge approach imprvs., near Texarkana. **$200,000.**

Mississippi Co.—bridge and embankment on Hy. 18 S. of Leachville, **$600,000.**

Polk Co.—bridges on Hy. 8, Mena, **$164,000.**

Pulaski Co.—constructing overpass in Little Rock, **$570,000.**

Scott Co.—bridges between Waldron and Boonesville, Hy. 23, **$134,000.** Alfred E. Johnson, Little Rock, engr. CD 12/24/43—ENR 1/13/44.

Fla., Daytona Beach—Comrs. Volusia Co., Deland, Seabreeze steel and concrete bridge across Halifax River, **$500,000.**

Georgia—State Hy. Dpt., Atlanta, bridge over Savannah River on State Route 43. Approx. **$100,000.** Patchen & Zimmerman, Daniel Field, Augusta, consult. engrs.

Ind., Fort Wayne—Comrs. Allen Co., Court House, bridge over St. Marys River, Taylor St., **$216,400.** Orin M. Darling, 2615 West Dr., consult. engr.; bridge over St. Marys River, Pos. south of Fort Wayne, **$105,000.** N. F. Zurbuck, 202 Paramount St., consult. engr. CD 8/27—ENR 9/16.

●**Ind., Indianapolis**—U. S. Eng., Federal Bldg., Louisville, Ky., and City Flood Control Bd., City Hall, main con. 3 span bridge over Fall Creek, Indiana Ave. **$300,000.** M. G. Johnson, city engr.

Kan., Ogden—Riley Co., Manhattan, bridge **$100,000.** Finney & Turnipseed, Northeast Bldg., Topeka, engrs.

Massachusetts—Commonwealth of Mass., Dpt. P. Wks., Boston.

Florida—bridge

Great Barrington—2 bridges

Hancock—bridge

Pittsfield—bridge

Sheffield—2 bridges

Williamstown—2 bridges, **$400,000.** Collins Eng. Co., 31 Hartford Terrace, Springfield, and Dunnuny-Duffill, Inc., 80 Boylston St., Boston, engrs.

●**Pennsylvania**—Commonwealth of Pennsylvania, Harrisburg.

Armstrong and Clarion Counties — bridge over Allegheny River between Armstrong Co. and point midway between Boros of Kittanning and East Brady, Clarion Co. **$1,500,000.**

●**Pennsylvania**—State Hy. Dpt., Harrisburg.

Washington and Westmoreland Counties—highway bridge over Monongahela River between North Charleroi, Washington Co. and Monessen, Westmoreland Co. **$2,000,000.**

Tex., Beaumont — Jefferson Co., 50x350 ft. I-beam center span and 12 25 ft. concrete spans, bridge across Taylors Bayou on La Belle Rd. 15 mi. southwest of here. **$300,000.** Charles L. Davidson, c/o owner, engr.

Virginia—State Hy. Dpt., Richmond.

Yorktown—2,540 ft. swing span bridge across the York River, near here. Parsons, Brinckerhoff, Hogan & Macdonald, 51 Broadway, New York, N. Y., consult. engrs.

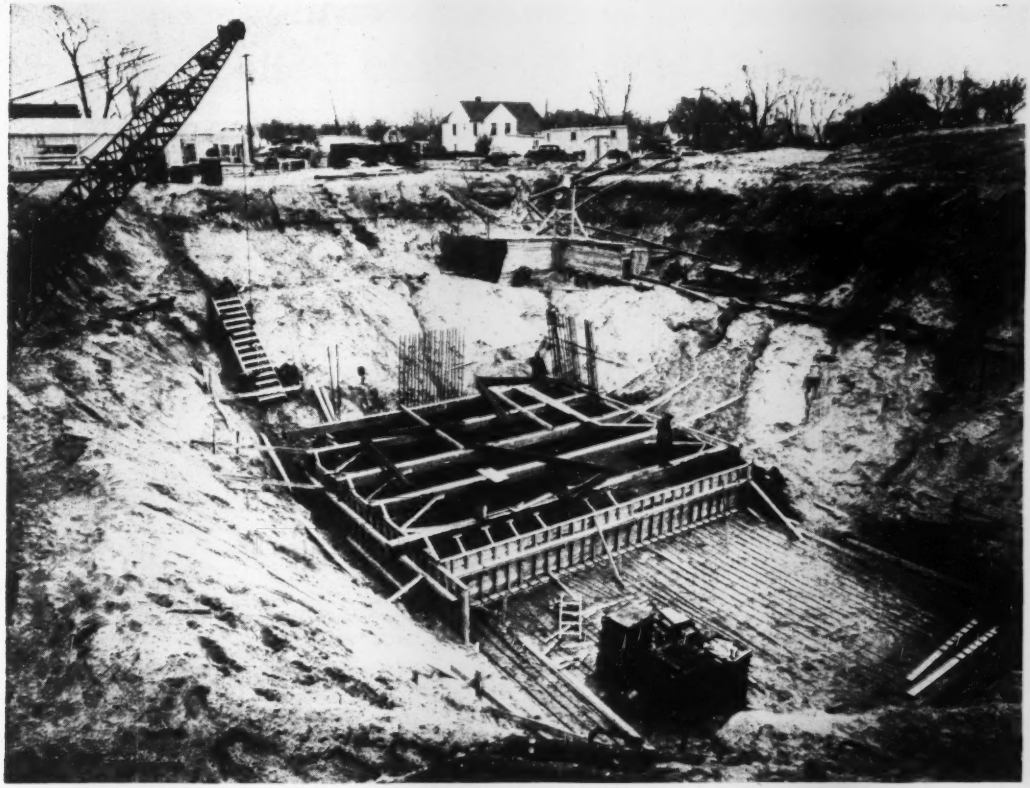
Washington — State Hy. Dpt., Olympia.

King Co.—reconstructing two Cedar River bridges on Renton—Enumclaw Hy. via Maple Valley. **$295,000.** O. R. Dinsmore, State Hy. Dir.

●**Washington**—State Hy. Dpt., O. R. Dinsmore, dir., Olympia.

Snohomish Co.—Everett-Union Slough bridge, **$1,470,000.**

(Continued on page 135)



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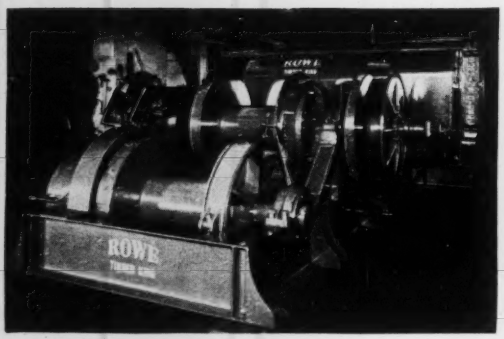
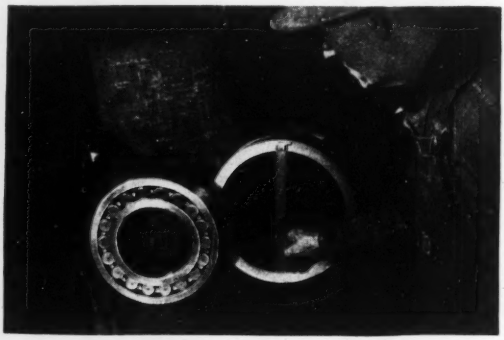
Torrington Spherical Roller Bearings Stand Up to Shock and Deflection In Rowe Timber King Yarders

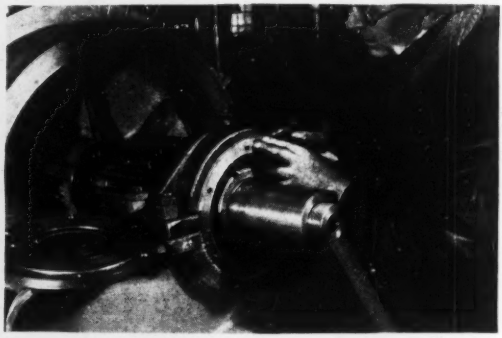


For handling heavy materials like logs, beams and pipe, Timber King Yarders have to be rugged. To back up a 32-ton line pull, and make sure each Yarder will stand up to hard usage and severe shock, Rowe Machine Works uses 6 Torrington Spherical Roller Bearings on main, haulback and strawline drums.



These precision bearings give the low torque that means easy starting under heavy loads, smooth running with low power consumption. When shock loads deflect drum shafts or distort yarder frames, Spherical Roller Bearings compensate automatically for misalignment, keep rolling effortlessly.

Easy handling and installation of Spherical Roller Bearings, due to their unit design, is appreciated both in assembly and servicing. Readily accessible, the bearings, reduce down time in the field. Were it necessary, two men could easily dismount and remount all six bearings in a day.



Welded construction of yarder frames would make it difficult to secure accurate alignment with rigid bearings. Spherical Roller Bearings make proper initial and running alignment a matter of course. Time is saved in assembly. Long service life is assured under the most severe operating conditions.

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Needle • Ball • Needle Rollers

(Continued from page 132)

Pend Oreille Co.—bridge over Pend Oreille River at Metaline Falls, $500,000.

●**British Columbia**—Province of British Columbia, Parliament Bldgs., Victoria.

Abbotsford, Chilliwack Electoral Dist.—bridge bypass of highway, $120,000.

Boundary Creek, Grand Forks Electoral Dist.—3 bridges, $100,000.

Britannia Creek, Lillooet Electoral Dist.—bridge, $60,000.

Bush River, 245, Columbia Electoral Dist.—bridge, $100,000.

Chemainus River, Cowichan-Newcastle Electoral Dist.—bridge, $200,000.

Clearwater River, 55, Kamloops Electoral Dist.—bridge, $50,000.

Cook Creek, North 28, Comox Electoral Dist.—bridge, $50,000.

Coquitlam River, Dewdney Electoral Dist.—bridge, $250,000.

Courtenay Slough, Comox Electoral Dist.—bridge, $50,000.

Cowichan River, Cowichan-Newcastle Electoral Dist.—bridge, $200,000.

Diamond Crossong, 27, Cowichan-Newcastle Electoral Dist.—bridge, $215,000.

Duncan Waggon, 30, Cowichan-Newcastle Electoral Dist.—bridge, $100,000.

Garvin Creek, Prince George Electoral Dist.—bridge, $70,000.

Goat River, Nelson-Creston Electoral Dist.—bridge, $175,000.

Ioco Dedwney Electoral Dist.—bridge, over highways, $80,000.

Little Sand Creek, 70, Fernie Electoral Dist.—bridge, $50,000.

Loope 13, Fernie Electoral Dist.—bridge, $115,000.

Marshall Creek 6 and 27, Chilliwack Electoral Dist.—bridge, $75,000.

Michel Mouth 9, Fernie Electoral Dist.—bridge, $115,000.

Mill Stream, Esquimalt Electoral Dist.—bridge, $100,000.

Mission Creek, South Okanagan Electoral Dist.—bridge, $50,000.

Niagara Canyon, Esquimalt Electora' Dist.—bridge, $100,000.

Old Town, 10, Fernie Electoral Dist.—bridge, $115,000.

Osoyoos Lake, Similkameen Electoral Dist.—bridge, $60,000.

Porphyry Creek 83, Skeena Electoral Dist.—bridge, $50,000.

Revelstoke—bridge over Canadian Pacific Railway tracks, $60,000.

River Bend, Alverni Electoral Dist.—bridge, $50,000.

Rosewall 135, Comox Electoral Dist.—bridge, $50,000.

Sandstone Creek 58, Esquimalt Electoral Dist.—bridge, $115,000.

Stave River, 99, Dewdney Electoral Dist.—bridge, $250,000.

Vedder Canal, Chilliwack Electoral Dist.—bridge, $350,000. CD 3/1/43—ENR 3/4/43.

Ontario—Province of Ontario, Toronto,

Cochrane—two 77 ft. span, cantilever wing walls, bridge over Muskego River, $150,000.

5 span 508 ft. steel deck truss bridge over Frederickhouse River, $150,000.

Quebec—Province of Quebec, Dpt. Mines, Quebec City.

Roberval — bridge over Chamouchouane River, Danault Twp., on road to mines towards Lake Chibougamu, $100,000.

St. Etianne de Lauzon—bridge over Beauvivage River.

St. Jullenne de Rawdon—bridge over St. Esprit River, $50,000.

Val d'Or — bridge over Dagenois River, $75,000.

STREETS AND ROADS

●**Ariz., Globe** — City, wid'n, Hys. 60 and 70 through city center replacing of Broadway bridge and railroad underpass, $1,000,000.

W. C. Lefebvre, 7 Ave. and Jackson St., Phoenix, engr. CD 2/1/46—ENR 2/21/46.

●**Arkansas**—State Hy. Dpt., Little Rock,

Ashley Co.—paving 6.4 mi. Hy. 165, Montrose, $271,000.

widen 12 mi. on Hy. 82, Montrose, $721,000.

Baxter Co.—paving 9 mi. Hy. 5, Mountain Home, $90,000.

Benton Co.—paving 5 mi. Hy. 100, Bentonville, $275,000.

Boone Co.—paving 11 mi. Hy. 7, Harrison, $400,000.

Calhoun Co.—paving 11 mi. Hy. 4, between Harrell and Banks, Harrell, $525,000.

Carroll Co.—paving 5 mi. Hy. 103, Green Forest, $100,000.

paving 5 mi. Hy. 21, Berryville, $100,000.

Clark Co.—paving 11.5 mi. on Hy. 7, Arkadelphia, $345,000.

reconstructing 11 mi. Hy. 67, Gurdon, $700,000.

Clay Co.—paving 7.3 mi. Hy. 90, Rector, $146,000.

Cleburne Co.—paving 12.3 mi. Hy. 16, Heber Springs, $250,000.

Cleveland Co.—paving 6.2 mi. Hy. 97, Kingsland, $125,000.

Columbia Co.—paving 16 mi. Hy. 82, Magnolia, $600,000.

paving 8 mi. on Hy. 19, Magnolia, $237,000.

Conway Co.—paving 19 mi. Hy. 9, Solgohotia, $430,000.

Craighead Co.—paving 7.6 mi. Hy. 143, Black Oak, $300,000.

Crawford Co.—wid'n, paving 7 mi. Hy. 64, Alma, $450,000.

wid'n, Van Buren City Connection Hy. 59, Van Buren, $110,000.

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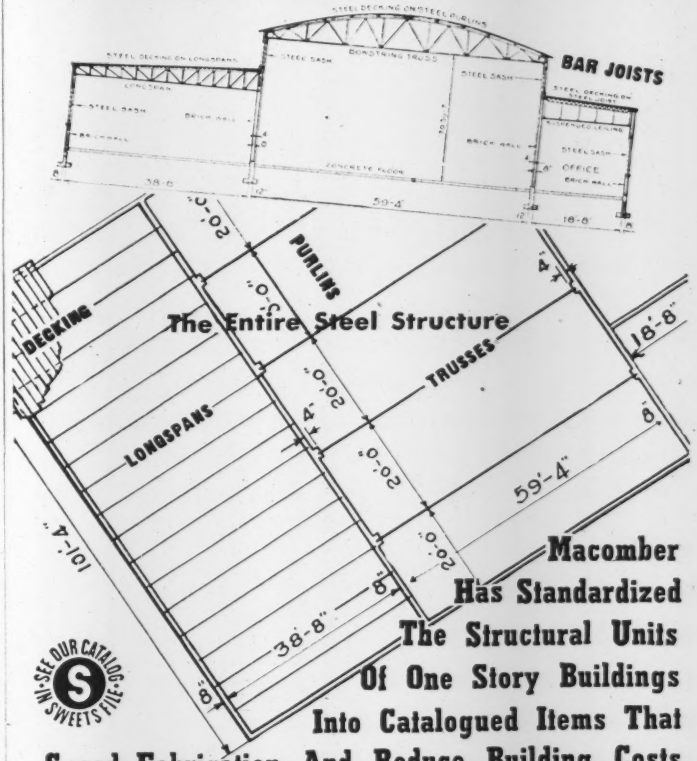

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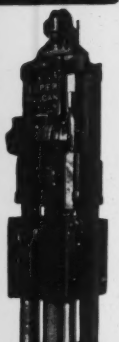

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Drew Co.—paving 12 mi. Hy. 4, Monticello, **$400,000.**

Faulkner Co.—paving 13 mi. Hy. 25, Greenbrier, **$210,000.**
paving 20 mi. Hy. 64, Conway, **$403,000.**
paving 3 mi. Hy. 64, Conway, **$225,000.**

Fulton Co.—imprv. 10 mi. Hy. 63, Mammoth Springs, **$466,000.**
paving 10 mi. Hy. 5 from Salem to Izard Co. line, Salem, **$250,000.**

Garland Co.—paving 10 mi. Hy. 9, Hot Springs, **$250,000.**

Hempstead Co.—pavement reconstr. 12 mi. Hy. 67, Hope, **$720,000.**
paving 7 mi. Hy. 4, Hope, **$185,000.**

Howard Co.—paving 6.2 mi. Hy. 4, Nashville, **$215,000.**
paving 10 mi. Hy. 70, Nashville, **$350,000.**

Izard Co.—paving 4 mi. Hy. 56, Calico, **$157,000.**
paving 7 mi. Hy. 9, Melbourne, **$175,000.**

Jefferson Co.—paving 10 mi. Hy. 88, Altheimer, **$250,000.**
paving 10.5 mi. Hy. 15, Pine Bluff, **$315,000.**
paving 8.8 mi. Hy. 270, Pine Bluff, **$208,000.**

Lafayette Co.—paving 10 mi. Hy. 29, Lewisville, **$225,000.**

Lawrence Co.—paving 3/10 mi. Hozie Connection Hy. 63, Hoxie, **$46,000.**

Logan Co.—paving 9½ mi. Hy. 23, Booneville, **$190,000.**

Lonoke Co.—paving 10 mi. Hy. 30, England, **$100,000.**

Miller Co.—wid'n. Hy. 82, through Texarkana, **$286,000.**

Mississippi Co.—paving 4½ mi. Hy. 18 S, Leachville, **$160,000.**
paving 15.7 mi. Hy. 14, Wilson, **$525,000.**

Monroe Co.—paving 8½ mi. Hy. 79, Clarendon, **$321,000.**
paving 7.3 mi. Hy. 86, Holly Grove, **$275,000.**
paving 7 mi. Hy. 17, Holly Grove, **$240,000.**

Nevada Co.—paving 8.3 mi. Hy. 24, Prescott, **$200,000.**

Phillips Co.—Paving 10 mi. Hy. 20, Marvell, **$466,000,** work 10 mi. on Hy. 44, Elaine, **$125,000.**

Pointsett Co.—paving 18 mi. Hy. 14, Harrisburg, **$600,000,** paving 9 mi. Hy. 63, Marked Tree, **$550,000.**

Polk Co.—paving 13 mi. Hy. 28, Mena, **$156,000.**

Pope Co.—paving 4 mi. Hy. 7, Russellville, **$160,000.**
paving 5.7 mi. Hy. 7, Dover, **$207,000.**

Pulaski Co.—resurf. parts of Hys. 65, 67 and 70, Little Rock, **$206,000.**

Randolph Co.—paving 1.2 mi. Hys. 62 and 67, Pocahontas, **$90,000.**

Sharp Co.—paving 10 mi. Hy. 11, Cave City, **$300,000.**

Stone Co.—paving 10 mi. Hy. 14, Mountain View, **$250,000.**

St. Francis Co.—imprv. 15.1 mi. Hy. 60, Forrest City, **$530,000.**

Taylor Co.—paving 12 mi. Hy. 132 Magnola, **$360,000.**

Union Co.—paving 5 mi. Hy. 15, Three Creeks, **$65,000.**

Washington Co.—paving 13 mi. Hy. 45, Goshen, **$150,000.**
short pavement of connection of Fayetteville, **$135,000.**
paving 7 mi. Hy. 68, Spring Valley, **$340,000.**

White Co.—paving 7.3 mi. connections on Hy. 67, Searcy, **$386,000.**

Yell Co.—paving 9 mi. Hy. 60, Plainview, **$135,000.**
paving 7 mi. Hy. 28, Rover, **$150,000.** Alfred E. Johnson, Little Rock, engr. CD 11/14/45—ENR 11/29/45.

●**Ark., Little Rock** — City, repairing streets over 10 year period, **$1,000,000.** Paul Zouder, City Hall, city engr.

Calif., Los Angeles—Los Angeles Bd. Supervs., 501 Hall of Records, imprv. Western Ave. from 182 St. to Torrance City Limits, over **$100,000.** C. E. Arnold, co. surv. and engr. CD 1/15/45—ENR 1/25/45.

†**Colorado**—Pub. Rds. Admin., 254 New Customhouse Bldg., **Denver,**

Delta and Mesa Counties—grading, base 4 mi. Cedar Edge and Mesa, Colo. Forest Proj. 13-A.

Douglas Co.—bit. 5.5 mi. Jarre Canyon, Colo. Forest Proj. 50-F-3, H-4.

Grand Co.—bit. 10.8 mi. south of Rand, Willow Creek, Colo. Forest Proj. 24-A-3, E-1, F-1.

Larimer Co.—bit. 2.2 mi. Rocky Mountain National Park, near Estes Park, Fall River Rd., Park Proj. 1-D-2.

Montezuma Co.—grading, base course 4.2 mi. Dolores-Rico, Colo. Forest Proj. 1-E, E-1.

Pueblo Co.—grading 3.9 mi. Greenhorn Hy., Colo. Forest Proj. 35-E.

Summit Co.—grading 7 mi. Loveland Pass to Fremont Pass, Colo. Forest Proj. 33-A-1, A-2, all foregoing approx. **$50,000** each. W. B. Matteson, div. engr. CD 10/16/46—ENR 12/31/46.

Colo., Denver—City and Denver Co., City and County Bldg., Denver, street imprv., Dist. 163, incl. concrete gutter, curb and curb walk, 3 in. gravel base course and necessary incidental imprvs. **$224,220.** Terry Owens, city engr.

Conn., Hartford — City Street Dpt., Municipal Bldg., 550 Main St., resurfacing streets incl. Park St. from Orange St. to City Line; Washington St. from Vernon to Webster St.; New Britain Ave. from Zion St. to Newington Ave.; Franklin Ave. from Brown St. to City

(Continued on page 139)

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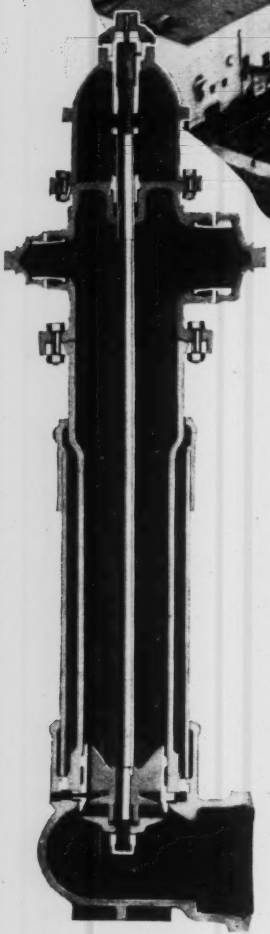

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Some Mathews in service today started their long and trouble-free life even before there was a seedless orange in the state of California. This *proved* dependability, plus the most modern features, makes today's version of the time-honored Mathews a standard by which all hydrants are judged. The thread is proof against rusting and deposits of silt. The revolving nut is protected against rain and wind-borne dust. The main valve is true compression-type; the drain valve drains perfectly dry. All working parts are contained in a removable barrel—easily and quickly replaced when every second can count.

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Manufacturers of "Sand-Spun" Pipe (centrifugally cast in sand molds) and R. D. Wood Gate Valves

(Continued from page 136)

Line, Trumbull St. and adjacent sections, **$152,800;** rebuilding streets about 6 mi., incl. 2,600 ft. on Fern St., 975 ft. John St.; 3,100 ft. on Cornwall St.; 1,600 ft. Shultas Pl.; 1,550 ft. Lafayette St.; 2,300 ft. Hillside Ave.; 4,000 ft. Westland St.; 3,400 ft. Park Terrace; 1,320 ft. Bartholomew Ave.; 975 ft. Mather St.; 5,000 ft. Flatbush Ave.; 3,300 ft. Prospect Ave., **$325,000.** H. Irving Skilton, Engrg. Dpt.

●**Ill., Chicago** — City, City Hall, c. conc. or asph. on c. conc., sidewalks, lighting, curbing, drainage, 4,300 ft. Montrose Ave. from N. Clark to N. Clarendon Sts., **$286,000;** 5,600 ft. E. and W. 31 St. from S. Wentworth Ave. to S. Lake Park Av., **$428,000;** 1 mi. 59 St. from S. Ashland to S. Halsted Sts., **$459,000;** 2,600 ft. W. Montrose St. from N. Western to N. Damen Aves., **$140,000;** 2,700 ft. 103 St. from S. Racine to S. Halsted Sts., **$245,000.** CD 4/26/45—ENR 5/17/45.

Ill., Chicago—P. Wks. Comn., City Hall, c. conc.—c. conc. or asphlt., 9,200 ft. S. Halsted St. between Pershing Rd. and S. Branch Chicago River, 51 ft. wide, incl. street lighting, sidewalks, curbing, etc., **$581,244;** c. conc.—c. conc. or asphlt., 5,300 ft. W. Montrose Ave., between Kedzie to Pulaski Rd., 42 ft. wide, incl. street lighting, sidewalks, curbing, etc., **$288,610.** CD 4/25/45—ENR 5/3/45.

Ill., Grayville—City, c/o City Council, voted $63,000 bonds, blacktopping, imprv. various streets. **$157,000.**

La., Cameron — Cameron Parish, Cameron, voted **$300,000** bonds, Mar. 16, Gulfcoast shortline Hy. between Port Arthur, Tex. and Vermillion Parish, La., CD 5/7/47—ENR 5/29/47.

Neb., Lincoln—City, City Hall, bond election May 3, repaving, wid'n streets, **$500,000.** D. L. Erickson, city engr. CD 1/17/45—ENR 2/8/45.

Neb., Omaha — City, City Hall, rebuilding Railroad Ave. from 24 and O St. to Sarpy County line, **$450,000.** E. W. Woodbridge, city engr. CD 1/26.

●**New York**—Dpt. Pub. Wks., Bertram D. Tallamy, Supt., Albany.

Jefferson Co.—13.85 mi. arterial highway system for Watertown, Downtown Inner Loop, divided highway having 2 travel lanes in each direction, encompassing areas now bounded by Sterling, Clinton, Sherman, West Lynde, Bridge and Mechanic Sts., incl. Bridge over Black River and underpasses at Factory and Olive Sts., traffic interchange facilities provided near present junction of Court, Coffeen and S. Massey Sts. West Main Street Route, reconstructing W. Main St. from proposed inner loop to city line, 4 travel lanes and 2 parking lanes and an underpass constructed at West Main St. railroad grade crossing; Bradley Street Route, reconstructing Bradley Street from West Main St. to city line with 2 travel lanes, 2 parking lanes, curbs and sidewalks; Leray Blvd., constructing 2 lane Hy. on new location parallel to and west of present Leray St. from proposed interchange at northerly end of Court Street Bridge to new connection with Route 11; Water Street Route, 1.7 mi. route, partially on new location from proposed inner loop connecting with Route 3 at city line; State and Gifford Street Route; reconstruct State and Gifford Sts. over present alignments; Arsenal Street Route, reconstructing Arsenal St. from the inner loop westerly to city line; 2 travel and 2 parking lanes and new viaduct over New York Central R. R. tracks; Massey-Ives Street Route, extending from Court Street Bridge, via Massey and Ives Sts. to junction with Route 11 near Circle Inn. **$6,438,100.**

Tompkins Co.—7.95 mi. arterial route system for city of Ithaca, Dryden Rd., Ithaca Rd. and East State St. (Route 13) between east city line and Aurora St. widened to provide 4 travel lanes; developing 3 lane, one-way thoroughfare for westbound traffic only from point on East State St. about 500 ft. east of Aurora St. to connect with Seneca St.; extens. ft. Green St. from N. Tioga St. easterly, passing under Aurora St., connecting with Route 13, consisting of 3 lane for eastbound traffic; 44 ft. pavement on Seneca St. between Meadow and Aurora Sts.; Incorporate Green St. from Meadow St. easterly to proposed new junction with Route 13 into The St. Hy. Sys. as an eastbound thoroughfare; relocate Route 96 by constructing two 24 ft. roadways divided by mall from point near Bundy Rd. north of the city line to Meadow St.; construct grade separation structure over the Lehigh Valley R. R. tracks, bridge over Cayuga Inlet and new connections to Taughannock Blvd.; reconstructing Meadow St., from Cascadilla St. southerly to connection with Routes 13 and 34, incl. bridge over Six Mile Creek; construct 44 ft. pavement on Cayuga St. from Tompkins St. southerly to Spencer St., incl. bridge over Six Mile Creek; two 30 ft. roadways, separated by mall on Cayuga St. from Tompkins St. northerly to north city line, new bridge over Fall Creek; new intersection with Lake St. and Route 34 north of the city line; reconstruct Spencer St. from Cayuga to Albany Sts. with pavement flanked by two 10 ft. shoulders from Albany St. to south city line; inclusion of Hancock St. into the St. Hy. Sys. Est. **$3,896,000.**

R. I., Warren — State Hy. Dpt., Providence, resurf., wid'n. approx. 11,600 ft. Main St. from Long Crossing to Warren Bridge. **$200,000.**

R. I., Warwick — State Hy. Dpt., Providence, approx. 1,400 ft. by-pass from Post Rd. to Greenwich Ave. **$120,000.**

●**South Dakota**—State Hy. Comn., Pierre,

(Continued on page 141)

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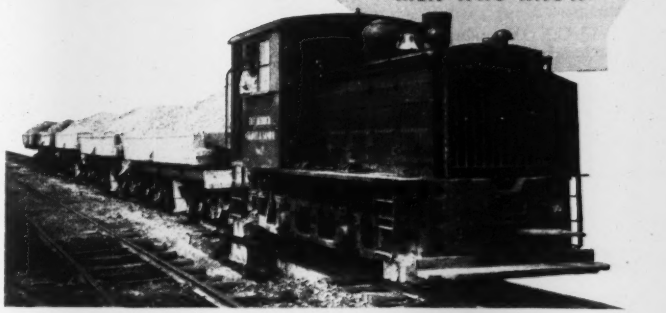

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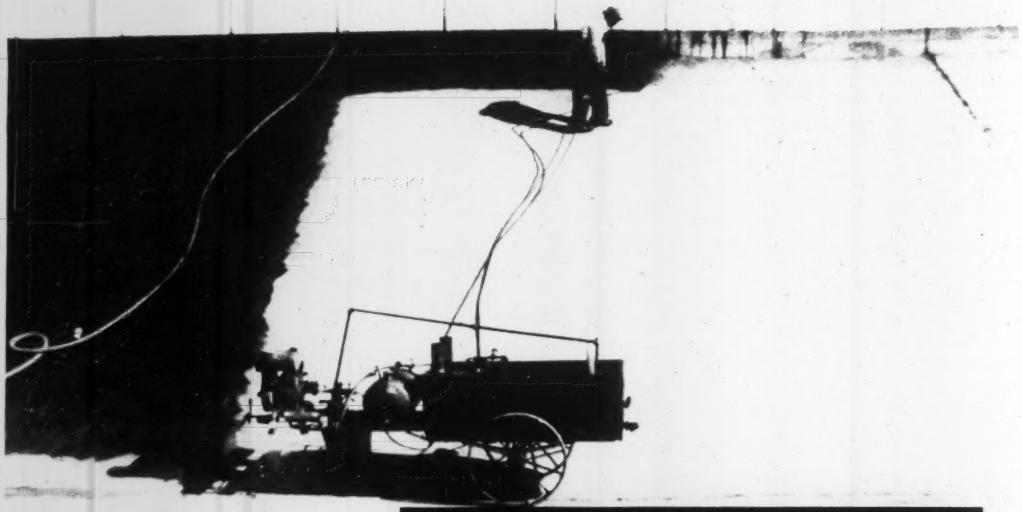

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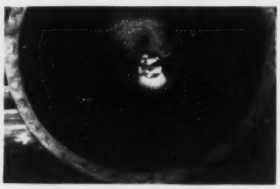
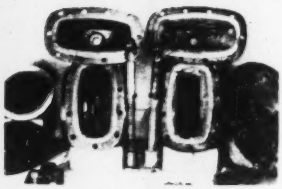


• Used as a pipe coating or lining, NO-OX-ID prevents tuberculation and corrosion.



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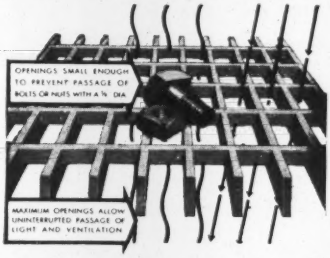
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(Continued from page 139)

Federal Aid Highways for 1949.

Beadle Co.—bit. 12.5 mi. U.S. 281 from U.S. 14 to North County Line.

Bennett Co.—bit. 7 mi. U.S. 18 from Martin west.

Brookings Co.—bit. 14.5 mi. U.S. 77 from Brookings to North County line.

Campbell Co.—bit. 7.9 mi. U.S. 83 from Herreid to Mound City.

Charles Mix Co.—base course, Class A surf. 4.3 mi. U.S. 281 from Platte north to Junction with S.T. 50.

Charles Mix and Brule Counties—base course, Class A surf. 5.1 mi. U.S. 281 from Junction with S.T. 50 North.

Codington and Grant Counties—bit. 9 mi. U.S. 81 from 1 mi. north of Codington Co. line south.

Corson Co.—base course, Class A surf. 9 mi. U.S. 12 from Watauga west.

Faulk Co.—service gravel 10.1 mi. U.S. 212 from Burkmere to Seneca.
base course, Class A surf. 7.2 mi. U.S. 212 from Burkmere East.

Faulk and Potter Counties—service gravel 22.1 mi. U.S. 212 from Gettysburg to Seneca.

Grant and Roberts Counties—bit. 10.6 mi. U.S. 81 from U.S. 12 south.

Gregory Co.—bit. 13.1 mi. U.S. 18 from West county line to Burke.
bit. 6.2 mi. U.S. 18 from Burke to Herrick.

Hutchinson Co.—base course, Class A. surf. 8.9 mi. St. 37 from Parkston to U.S. Hy. 18.

Marshall Co.—bit. 12 mi. St. 10 from Britton easterly.

Minnehaha Co.—c. conc. 9.6 mi. St. 38 from Hartford East.
grading, service gravel 7.1 mi. St. 19 from Humboldt to U.S. Hy. 16.
bit. 14.3 mi. St. 19 from North County Line to St. Hy. 38.

Perkins Co.—base course, Class A surf. 10.7 mi. U.S. 12 from Lemmon to North Dakota State Line.

Shannon Co.—base course, Class A surf. 3.3 mi. St. 75 from Nebraska State Line north.
base course and Class A surf. 8.2 mi. U.S. 18 from East County Line westerly.

Jackson Co.—grading, service gravel 9 mi. U.S. 16 from East County Line to East of Belvidere.

Jones Co.—grading, service gravel 15.8 mi. U.S. 16 from West County Line to west of Murdo.
base course and Class A surf. 10.8 mi. U.S. 16 from Draper to West of Murdo. Approx. **$4,670,906.**

Federal Aid Secondary Highways on State Trunk System

Aurora Co.—base course, Class A surf. 6.8 mi. St. 41 from South County Line to Stickney.
base course and Class A surf. 8.2 mi. St. 41 from Stickney to U.S. Hy. 16.

Deuel and Hamlin Counties—base course, Class A surf. 6.1 mi. St. 28 from Estelline to U.S. Hy. 77.

Douglas Co.—base course, Class A surf. 5.4 mi. St. 41 from Corsica to North County Line.

Harding Co.—grading, grav. 8.2 mi. St. 8 from U. S. Hy. 85 East.

Lincoln Co.—grading, service gravel 1 mi. St. 17 and St. 44 from Lennox south.
grading, service gravel 5 mi. St. 17 from 1 mi. south of Lennox to U.S. Hy. 18.

Minnehaha Co.—grading, base course 3 mi. St. 11 from Garretson East 3 mi.
one structure St. 11 near Corson.
c. conc. 2.9 mi. County Rd. from northwest corner of Sect. 31-102-49 Northwest of Sioux Falls to U. S. Hy. 77.

Pennington Co.—grading, service gravel 7 mi. St. 40 from Rapid City to Airport.
base course and Class A surf. 7 mi. St. 40 Rapid City to the Airport.

Perkins Co.—base course, Class A surf. 10.8 mi. St. 73 from U.S. Hy. 12 South.
gravel surf. 14.8 mi. St. 73 from St. 8 South.
gravel surf. 8.5 mi. St. 8 and 73 from East of Meadow South.

Turner, Lincoln, Clay and Union Counties—base course, Class A surf. 8.9 mi. St. 46 from Beresford to St. 19.

Turner and Clay Counties—service gravel 4 mi. St. 46 from Irene East.
service gravel 6 mi. St. 46 from St. 19 West. Approx. **$1,608,092.**

Programmed Prior to 1949. Remain To Be Let To Contract

Brule Co.—service gravel 14 mi. U.S. 281 from U.S. 16 south.

Clark and Hamlin Counties—service gravel 21 mi. St. 28 from St. 25 to U.S. 81.

Codington Co.—service gravel 12 mi. St. 20 from Florence South.

Custer and Pennington Counties—base course 7.2 mi. U.S. 85 from Custer North.

Dewey Co.—bit. 12 mi. U.S. 212 from Ridgeview westerly.

Hamlin Co.—service gravel 12.4 mi. St. 28 from Estelline to U.S. 81.

Hughes Co.—service gravel 11.9 mi. St. 34 from Defirey easterly.

Jackson Co.—grading 3 mi. St. 40 from Badlands National Park North.

Lawrence Co.—bit. 10.9 mi. U.S. 14 from Wyoming State Line to Spearfish.

McPherson Co.—base course 3 mi. St. 10 from Leola West.
base course 5 mi. St. 10 from Eureka East.
base course 4 mi. St. 10 from West of Leola West.

Marshall Co.—service gravel 15.4 mi. St. 10 from East County Line West.

Meade Co.—base course 10.2 mi. U.S. 212 from Faith West.

Minnehaha and Lincoln Counties — base

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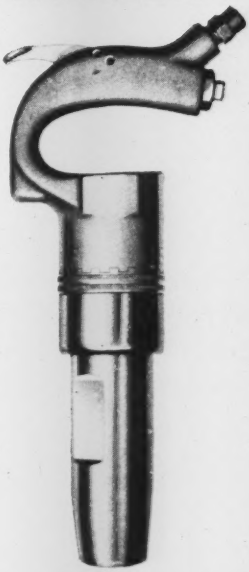

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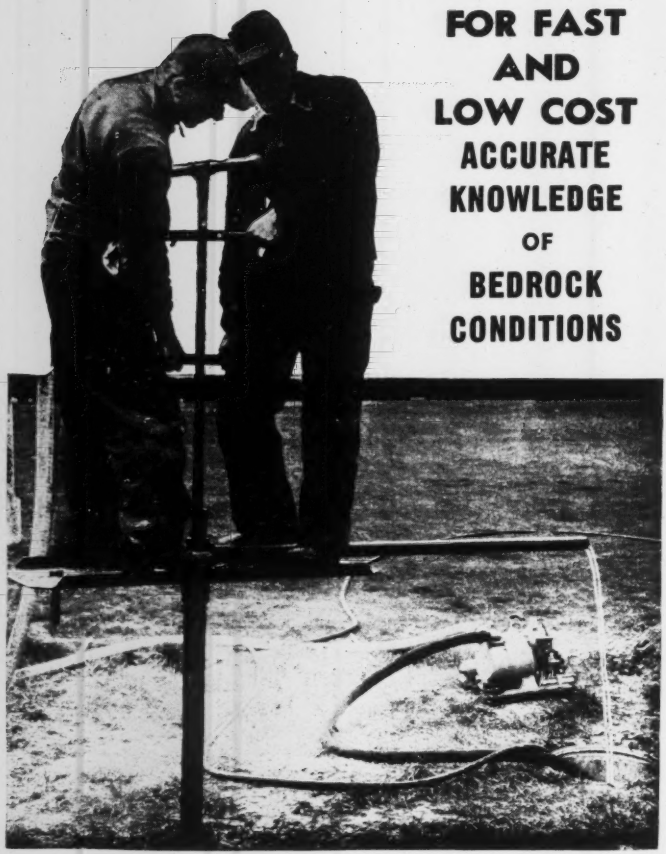

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course 13.8 mi. St. 17 from U.S. 16 to Lennox.

Roberts Co.—grading, service gravel 8.5 mi. St. 10 from West County Line to Sisseton.

Todd Co.—base course 18.2 mi. U.S. 18 from Okreek to Mission.

service gravel 12 mi. U.S. 83 from Nebraska State Line North.

Tripp Co.—base course 20 mi. U.S. 183 from Presho to Jordan.

Turner Co.—base course 7 mi. U.S. 18 from East County Line to St. 19.

Union Co.—c. conc. 0.5 mi. U.S. 77 city of Elk Point. Approx. **$2,987,573.**

Tex., Houston — Tex., Houston-United Home Builders, Inc., 10,000 Humble Rd., asph. paving roads and streets. **$100,000.**

Tex., Taylor — Williamson Co. c/o judge, Courthouse, Georgetown, bond election Apr. 23, approx. 18 mi. roads connecting with 2 main highways, Southern half of Precinct 4, **$350,000;** approx. 30 mi. black-topped road and feeder and gravel roads, northern half of Precinct 4, **$400,000.** CD 11/10—ENR 11/25.

Tex., Terrell Hills—Terrell Hills, c/o Nelson Miller, 305 Charles Rd., concrete curbing, asph. paving all streets. **$400,000.**

Washington—State Hy. Dpt., O. R. Dinsmore, d.r., Olympia.

King Co.—improv. Bothell-North Bend Hy., relocating, grading and bridges, Wayne vicinity to Woodinville, **$350,000.**

resurfac., sub-sealing 1.8 mi. Woodinville south, **$30,000.**

fill and culvert at Dry Gulch Bridge, **$25,000.**

reconstructing Tokul Creek bridge, **$10,000.**

b. conc. Snoqualmie Falls hill, **$18,000.**

resurfac., sub-sealing 0.8 mi. Fall City east, **$12,000.**

following on Primar State Hy. 5, wid'n. shoulders, resurf., sub-sealing 2.6 mi. Renton south, **$60,000.**

spot ballast and non-skid seal 12.7 mi. Greenwater vicinity, **$75,000.**

spot ballast and mixed seal 1.7 mi. Enumclaw east, **$6,000.**

bit. repair, Enumclaw to Greenwater, **$15,000.**

spot ballast and non-skid seal 6.6 mi. Dallas recreation Silver Creek vicinity, **$30,000.**

Crystal Creek Vicinity, **$20,000.**

●**Washington**—State Hy. Dpt., Olympia.

King Co.—improvs. on Primary State Hy. No. 1, incl. paving 4.1 mi. Issaquah Junction west, **$100,000.** reconstructing buoyancy system in draw span of Lake Washington floating bridge, **$100,000.** improv. drainage and illumination of tunnel west of bridge, **$35,000.** location work on 11 mi. Renton-Issaquah Sect. **$11,000.** non-skid seal on 11.8 mi. Issaquah Junction to North Bend, **$30,000.** b. conc. Preston cut-off, **$10,000.** location work 10 mi. Primary St. Hy. No. 1, Seattle to Pierce County line, **$10,000.** relocating, grading, surfacing 3 mi. Secondary St. Hy. 2-A, Kennydale vicinity, **$270,000.** improvs. on Fairfax branch of Primary State Hy. No. 5, incl. grading, surfacing, oiling and bridge 1.4 mi. Buckley to White River, grading, surfacing, oiling 3.1 mi. White River to Enumclaw, **$162,000.** following on Renton-Enumclaw Hy., bit. macad. 4.9 mi. Kraus to Black Diamond, **$35,000.** resurfacing, sub-sealing 3.4 mi. Renton east, **$50,000.** relocating, grading, surfacing 1 mi. Secondary St. Hy. 1-L, Mukilteo north, **$150,000;** relocating, grading, surfacing 2.1 mi. Secondary St. Hy. 1-L, **$170,000.** widening shoulders and drainage improvs. 2.7 mi. Secondary St. Hy. 1-D, Lake City to junction with Pacific Hy. **$6,000.**

Snohomish Co.—paving Broadway cut-off in Everett, **$320,000.** paving, resurfacing 3.7 mi. Primary St. Hy. No. 1, Snohomish to King County Line, **$150,000.** Seattle-Everett connection with Broadway cut-off, **$30,000.** O. R. Dinsmore, St. Hy. Dir.

●**Washington**—State Hy. Comm., Olympia.

Yakima Co.—improv. following highways Yakima to Kittitas Co. line, **$910,000.**

Parker Bridge to Buena, **$670,000.**

Buena to Sunnyside, **$1,095,000.**

Sunnyside to Benton Co. line, **$315,000.**

Buena to Toppenish, **$260,000.**

Toppenish to Klickitat Co. line, **$1,425,000.**

surfacing, oiling White Pass Hy. **$650,000.**

Chinook Pass Hy. Cliffdell to summit, **$1,080,000.**

Yakima to Naches, **$180,000.**

Union Gap-Parker, **$155,000.**

Parker-Toppenish, **$330,000.**

Toppenish-Mabton, **$890,000.**

Mabton to Benton Co. line, **$360,000.**

Benton Co., line to Prosser, **$260,000.**

Secondary State Hy. 3-B, White Swan to Toppenish, **$220,000.**

Toppenish Creek to Lateral C, **$140,000.**

Toppenish to end of pavement, **$60,000.**

end of pavement to Goldendale, **$200,000.**

West Wapato-Parker, **$245,000.**

Secondary State Hy. 3-C, West Wapato Rd. **$225,000.**

Secondary State Hy. 11-A, city limits to Moxee, **$365,000.**

●**British Columbia** — Province of British Columbia, Victoria.

100 Mile House — paving 47 mi. Cariboo Hy. 47 mi. south from here, **$500,000.**

Armstrong-Enderby — paving 9 mi. Okanagan Hy., between Armstrong and Enderby, **$95,000.**

Beaver Creek and Great Central Lake — paving 10 mi. **$105,000.**

Castlegar-Nelson — paving 25 mi. Section Trans-Provincial Hy. between Castlegar and Nelson, **$250,000.**

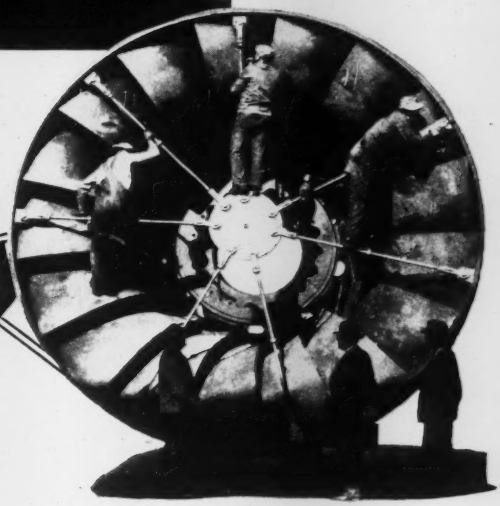
Chilliwack —, paving 20 mi. Trans-Can.

(Continued on page 114)

Aerial view showing proposed diversion of the Colorado River at the Davis Dam site.

First Davis Dam runner upon arrival at the Bureau of Reclamation storehouse enroute to the dam site. Workmen are unbolting the steel "spider" used to brace the runner during shipment.

DESTINATION— DAVIS DAM



Between 800,000,000 and 1,000,000,000 kilowatt hours of badly needed electrical energy will be added to the nation's annual power supply with the completion of Davis Dam. Last link in a comprehensive plan to conserve and utilize the waters of the Colorado, this dam will impound 1,800,000 acre-feet of water, and harness every available foot of head between the site and the Hoover Dam tail race.

Five giant Baldwin turbines, each with a rating of 62,200 HP under a 120-foot head, will turn the 45,000 kva generators. Two of the turbine runners—the largest ever cast in one piece—have already been shipped after machining at Baldwin. The remaining three will soon be on their way. Baldwin equipment, reinforced by Baldwin experience, has helped in the development of some of the world's largest hydro-electric projects.

BLW THE BALDWIN GROUP **BALDWIN**

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Move an agile Osgood hoe right up to the job—and into it—with no lost motion. Its reputation is built on superior speed, mobility, power, and a high and far reach that allows the operator to pick up a load anywhere and to drop it accurately—wherever he wants it.

Yes, whatever the job, you can move more dirt, faster, with an Osgood—Shovel, Dragline, Crane, Clamshell, or Hoe. Gasoline, Diesel or Electric powered—$^3/_8$ to $2^1/_2$ cu. yds. Write for descriptive literature and specifications.

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(Continued from page 142)

Hy., Chilliwack easterly towards Hope, **$210,000.**

Cowichan Lake — paving 15 mi. Cowichan Lake Rd., **$155,000.**

Cranbrook-Kimberly — paving 17 mi. hy. between Cranbrook and Kimberly, **$180,000.**

Fort Steele Junction-Jeffray — paving 22 mi. Southern Trans-Provincial Hy. between Fort Steel Junction and Jaffray, **$230,000.**

Grand Forks — paving 10 mi. Southern Trans-Provincial Hy. west of Grand Forks, **$105,000.**

Hope-Princeton — paving 74 mi. Southern Trans-Provincial Hy., east of Hope, to Princeton, **$750,000.**

Parksville-Qualicum — paving 7 mi. Island Hy. in vicinity of Parksville and Qualicum, **$75,000.**

Prichard-Chase — 14 mi. Trans Canada Hy. between Prichard and Chase, **$145,000.**

Rock Creek — 11 mi. Southern Trans-Provincial Hy., east Rock Creek, **$115,000.**

Trail-Fruitvale — 7 mi. Hy. between Trail and Fruitvale, **$75,000.** H. C. Anderson, Parliament Bldgs., Victoria, engr. CD 3/1/43—ENR 3/4/43.

EARTHWORK, WATERWAYS

†Idaho — U. S. Eng., 19 E. Poplar St., Walla Walla, Wash., repairing levees and revetments, Snake River between mouth of Henrys Fork and U. P. R.R. East Belt Bridge in Madison and Jefferson Counties, Serial No. Eng. 45-164-49-46.

†Illinois — U. S. Eng., 826 U. S. Court House and Custom House, St. Louis, 1, Mo., levee imprv., Harrisonville and Ivy Landing Drainage & Levee Dist., Proj. Item 1-A (1 Monroe Co.

●Massachusetts — Commonwealth of Mass., State Dpt. P. Wks., 100 Nashua St., Boston, and U. S. Govt., stone & concrete breakwater, Provincetown Harbor, **$1,500,000.**

†New Mexico—U. S. Eng., Box 1538, Albuquerque, Rio Hondo Channel imprvs., incl. clearing approx. 10 acres river channel, Eng-29-005-49-68.

Tex., El Campo — City, Paul Herrmann, mayor, drainage sys. imprvs., extens. **$150,000.** Ford Hudson, city engr.

AIRPORTS AND AIRBASES

†N. J., Trenton — AIRPORT — Bureau Yards and Docks Annex, Navy Dpt., Arlington, Va., plans by Frank Grad & Son, 157 Market St., Newark, shop bldg., Mercer Airport. Over **$150,000.** Jaros Baum & Bolles, 37 Wall St., New York, N. Y., consult engrs.

N. C., Wilmington — AIRPORT BLDG. — New Hanover Co., Wilmington, plans by Leslie N. Boney, Jr., Murchison Bldg., administration bldg. at Bluethenthal Airport. **$160,000.** CD 10/2/47—ENR 10/16/47.

●Ore., Portland — AIRPORT — Port of Portland, Spalding Bldg., plans by John W. Cunningham & Assoc., Spalding Bldg., runway and other imprvs. **$2,582,551.** CD 9/29—ENR 10/14.

†Tex., Ellington Field (near Houston)—AIRFIELD BLDGS.—U. S. Eng., 606 Santa Fe Bldg., Galveston, remodeling, rehabilitating field bldgs., **$250,000;** storage and warehousing, **$100,000.** CD 8/6—ENR 8/12.

Tex., Grand Prairie — HANGAR — Chance-Vought Aircraft, c/o Earl Martin, Grand Prairie, plans by Albert M. Kahn & Assoc., 345 New Center Bldg., Detroit, Mich., hangar, **$100,000.** CD 4/26—ENR 5/13.

Va., Roanoke—ADMINISTRATION BLDG.—City, Municipal Bldg., plans by Eubank & Caldwell, Boxley Bldg., administration bldg. at Woodrum Field. **$320,000.** CD 6/30/44—ENR 7/13/44.

PUBLIC BUILDINGS

Ala., Brewton—Escambia Co. Hospital Assn., Brewton, plans by Charles H. McCauley, Jackson Bldg., Birmingham hospital. **$500,000.**

●Calif., Los Angeles—Bd. Regents University of California, 451 N. Hilgard Av., plans by Wurdeman & Becket, 3727 Wilshire Blvd., Medical School, first unit, **$15,500,000;** L. T. Evans, 2500 W. 6 St., Los Angeles, consult. engr.; plans by Douglas McClellan, 816 W. 5 St., Los Angeles, administration bldg., **$1,500,000.** CD 8/24/44—ENR 9/7/44.

Colo., Denver—University of Colorado, Medical School, 4200 E. 9 Ave., plans by Fisher & Fisher, 827 Denver Natl. Bank Bldg., cancer research bldg., at University of Colorado medical school. **$558,000.**

Conn., East Hartford—Town, E. Leonard Clarkin, chn., East Hartford Housing Auth., plans by Kane & Faitch, ld. 40 Pearl St., Hartford, 50 family units, Riverside Park, **$519,000.** CD 10/8—ENR 10/28.

●†Conn., Hartford—Pub. Bldgs. Admin., F Ave. between 18 and 19 Sts. N. W., Wash. D. C., brick, steel, stone post office. **$7,000,000. FWA.**

●†Idaho, Arco—U. S. Atomic Energy Comm., 1901 Constitution Ave. N. W., Wash., D. C., atomic reactor testing station, 400,000 acre site, near Pocatello, **$100,000,000.**

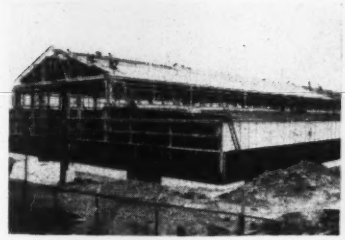
●Ia., Davenport—Bd. Educ., Davenport, voted **$3,500,000** bonds Mar. 14, school.

●Ia., Marshalltown—Bd. Educ., Marshalltown, voted $500,000 bonds school, **$1,000,000.**

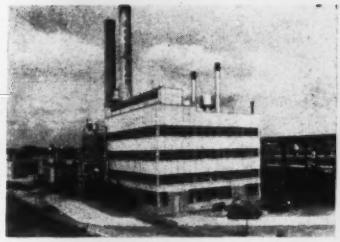
Kan., Emporia—State Bd. Regents, Topeka, plans by C. L. Marshall, state archt., William Allen White Memorial Library, at Emporia State College. **$850,000.**

La., Bogalusa—City, City Hall, plans by Smith & Padgett, Monroe, Washington-St Tammany Charity Hospital. **$600,000.**

(Continued on page 147)

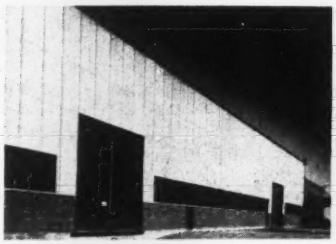


Cemesto installation for Consolidated Edison Co., Astoria, L. I., N. Y. Cemesto erection contractor: John Munder.

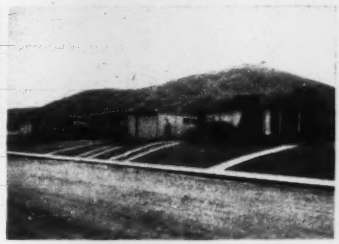


Attractive and economical use of alternate bands of glass and Cemesto for power plant at Goodyear Tire & Rubber Co.

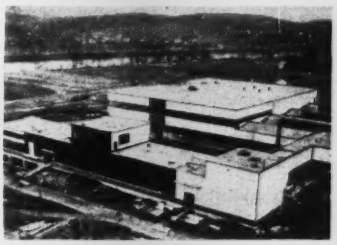
U.S. Navy residence building of Cemesto and brick masonry built in 1939 at Brooklyn, New York.



Simple beauty of Cemesto in a curtain wall. Curtis-Wright Corp., Louisville, Ky. Architect: Albert Kahn, Detroit, Mich.



Row of modern California houses built with Cemesto. La Jolla, Calif. Contractor: Kesling Modern Structures.



42,000 square feet of Cemesto used for roof deck and curtain walls. B. F. Goodrich Co., Marietta, O.

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Cemesto is a rigid, fire- and weather-resistant panel made of Celotex cane fibre to which cement-asbestos board is bonded on both sides by a moisture-proof bituminous adhesive. It combines high thermal insulation with exceptional structural strength. Its hard, smooth, light-reflecting surfaces provide both exterior and interior finish that need no painting or maintenance.

Cemesto can be worked with ordinary hand or power tools, and is easy to apply. It speeds construction, cuts costs. It will pay you to investigate the many possibilities of this versatile material for your own use. Write today for complete technical data, plus application recommendations. No cost or obligation.

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Cemesto is the *preferred* material for roof decks because it affords important economies in design, application, maintenance.

Caulking joints between Cemesto panels. Carolina Asbestos Co., Marshville, N. C. Contractor: Interstate Const. Co. Architect: A. G. Ulrey.

Asphalt roll roofing applied over Cemesto. Pittsfield Township School, Washtenaw, Mich. Architect: C. Noble. Contractor: DeKenning Const.

The 14-ton key to the city haul!

WHEN THIS SUBWAY excavation began, one problem was to find trucks that could truck the muck 24 hours a day and set a profitable pace over a route, 128 city blocks long!

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This operation required specialized equipment built for the job. The heavy-duty 6 x 4 International KB-11-F was selected. Reinforced side rails withstand unusual shock stresses of big loads dropping into the bed from elevated loading hoppers. The special power divider with integral auxiliary transmission provides a low creeper gear for pulling out of bad spots and an axle ratio coordinated with the main transmission to provide cruising speeds required to meet the schedule. Because of the heavy loads hauled through heavily congested areas, large-size heavy-duty air brakes were installed to insure safe operation.

That's what International means when it says it builds trucks *specialized* for the job. International offers 22 basic models, with gross weight ratings ranging from 4,400 to 90,000 pounds. And it forms 1,000 different truck combinations from 'em—one for every load, road, and haul.

And International's service facilities are just as complete as the line of trucks it offers. 4,700 International Dealers and 170 company-owned Branches are waiting to wait on you . . . any place . . . any time.

So whether you're working on a subway or a skyscraper, a sewer or a sausage factory, International offers a complete line of trucks specialized to the job. A call to your nearest International Dealer or Branch will put you on the right track to the right truck. Why not put in that call right away!

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Tune in James Melton and "Harvest of Stars"
NBC, Sunday afternoons

INTERNATIONAL TRUCKS

INTERNATIONAL HARVESTER COMPANY · CHICAGO

(Continued from page 144)

●**Mass., Attleboro** — City, J. Turner, chn., Attleboro Housing Auth., plans by S. S. Elsenberg, 69 Summer St., Boston, 35 houses, South Ave., **$1,100,000.** CD 11/10—ENR 12/9.

Mass., East Bridgewater — Town, School Dpt., plans by Perry, Shaw & Hepburn, 955 Sq. Bldg., Boston, school, **$600,000.** Cleverdon-Varney & Pike, 120 Tremont St., Boston, engrs. CD 9/4/47—ENR 9/18/47.

Mass., New Bedford—City, Wm. K. Burks, supt. P. Bldgs., brick, steel municipal auditorium, **$500,000.**

Mass., South Peabody—City of Peabody Housing Auth., Al Arsenault, chn., Peabody, 68 unit housing, Lynn St., **$680,000.**

Mass., Wayland—Town, Trustees Jonathan Maynard Parmenter Fund, C. D. Scotland, pres., brick, steel, concrete hospital. **$500,000.**

O., Hamilton—Bd. Educ., H. H. Howard, bus. mgr., 332 Dayton St., plans by Outcalt, Guenther & Assoc., 3124 Shaker Square, Cleveland, 2 story, part bsmnt., Jefferson Tyler elementary school. **$750,000.** CD 1/3/47—ENR 1/23/47.

●**Pa., Shamokin**—Commonwealth of Pennsylvania, Harrisburg, addnl. bldgs. to house proposed division of heart ailments at Shamokin State Hospital. **$3,000,000.**

●**R. I., Newport**—City, City Hall, plans by J. E. Nichols, 7 S. Main St., West Hartford, Conn., brick, steel, concrete Senior High School. **$1,500,000.** CD 5/22/44—ENR 6/1/44.

●**Tenn., Nashville**—State Bd. Educ., State Office Bldg., plans by Marr & Holman, Stahlman Bldg., school for blind. **$2,000,000.** CD 1/7/48—ENR 1/29/48.

Tex., Beaumont — Beaumont Independent School Dist., Beaumont, plans by Maurice E. Wilmer, Beaumont, high school and vocational shop. **$590,000.** CD 7/1—ENR 7/22.

●**Tex., Corsicana**—Navarro Co. c/o Comrs. Court, Joe D. Huffstutler, judge, **$550,000** bond election Apr. 12, 100 bed memorial hospital, **$1,200,000.** CD 6/7—ENR 6/17.

●**Tex., Freeport** — Brazosport Independent School Dist., c/o Terrell W. Ogg, supt., plans by Emory S. White, M & M. Bldg., Houston, 1 story masonry, concrete, steel high school, concrete slab fdn., rein.-con. outdoor type swimming pool. **$1,500,000.** W. P. Moore, 4605 Montrose St., Houston, structural engr. Dale S. Cooper & Assoc., 420 Sul Ross Ave., Houston, mechanical engr. CD 10/4—ENR 10/28.

●**Alta., Edmonton**—Eastern Rockies Forest Conservation Bd., Edmonton, forest development, watershed protection, eastern slopes Rocky Mountains, **$1,152,000** voted.

●**Ont., Hamilton**—Dpt. P. Wks., Hunter Bldg., Ottawa, Ont., veterans bldg., Main and Caroline Sts. Approx. **$2,500,000.** G. Brault, c/o owners, archt. CD 12/10/45—ENR 3/7/46.

COMMERCIAL BUILDINGS

●**Calif., Belmont**—G. W. Williams, 10 California Dr., Burlingame, 400 residences in Foothill Tract. **$4,000,000.**

Calif., Millbrae—Neils Schultz, 1 Hillcrest Blvd., 100 residences in northern limits of Highland Dist. Approx. **$500,000.**

Minn., East Grand Forks—Sacred Heart Parish, Rev. A. I. Merth, plans by U. L. Freed, Aberdeen, S. D., church, parochial school, rectory, heating plant. **$500,000.**

N. Y., Bayside — Floveland Realty Corp., c/o G. C. Miller, archt., 67 W. 44 St., New York, Zone 18, 14 two family houses, 196 Pl. and 69 Ave.; 12 two family houses, 196 Pl. and 69 Ave.; 22 two family houses, 197 Ave. between 197 St. and 196 Pl.; 22 two family houses, 69 Ave. between 197 St. and 196 Pl. **$719,000.**

N. Y., Bayside — Jeffrey Gardens Apartments, c/o Samuel Paul & Assoc., archts., 163-18 Jamaica Ave., Jamaica, apartments, 48 Ave. and 216 St.; 217 St. near 48 St., 216 St. near 48 St., 47 Ave. and 216 St. **$620,000.**

N. Y., Bayside — Rayland Realty Corp., c/o G. C. Miller, archt., 67 W. 44 St., New York, Zone 18, 13 two family houses, 196 Pl. and 75 Ave.; 15 two family houses, 196 Pl. and 69 Ave.; 23 two family houses, 69 Ave. between 197 and 196 Sts.; 23 two family houses 73 Ave. between 197 St. and 196 Pl. **$820,500.**

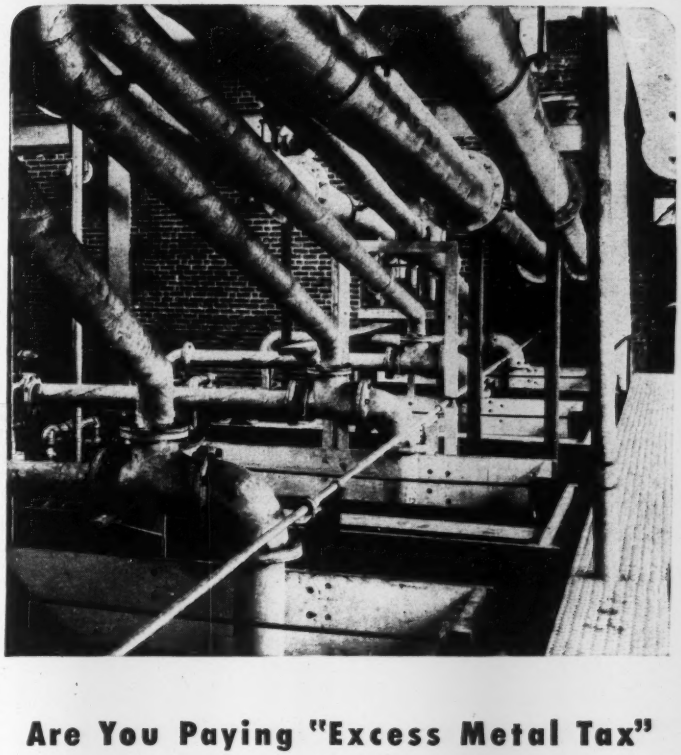
N. Y., Brooklyn — 100 Remsen Street, Inc., 521 Fifth Ave., New York, plans by A Rollin Caughey, 1150 Ocean Ave., Zone 30, 8 story apartment, 100-106 Remsen St. **$400,000.**

N. Y., Far Rockaway — W. F. Brumna, c/o Lederer & Joseph, archts., 66 Court St., Brooklyn, Zone 2, 47 one family houses, Beach 90 and Beach 89 Sts., and Beach Channel Dr. **$352,500.**

N. Y., Far Rockaway — Mott Improvement Corp., c/o Schulman & Soloway, archts., 4 Court Square, Brooklyn, Zone 2, 3 story apartment, Dickens St. and Mott Ave., **$258,000;** 3 story apartment, Eggert Pl. and Mott Ave. **$258,000;** 3 story apartment, Mott Ave. and Dickens St. **$234,000.**

●**N. Y., Floral Park** — Langdale Realty Corp., c/o Samuel Paul & Assoc., archts., 163-18 Jamaica Ave., Jamaica, 170 two family houses, Langdale and 268 Sts., 81 and 83 Aves. **$1,682,000.**

●**N. Y., Flushing** — Hunter Garden Apartments, Inc., c/o Lama, Proskauer & Prober, archts., 283 Pearl St., Brooklyn, Zone 1, 2 three story and one 6 story apartments, 38 Ave. and 149 St. **$2,800,000.**



Are You Paying "Excess Metal Tax" On Plant Piping?

Why spend precious piping dollars for excess weight and material? By specifying ARMCO Welded Steel Pipe you can avoid this "tax"—get more pipe for your money.

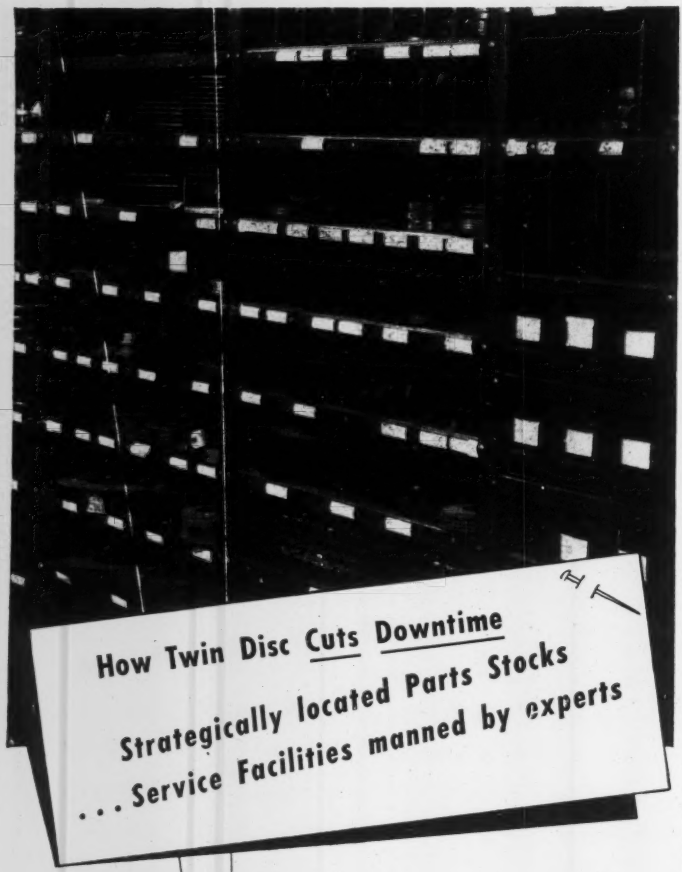
Here's how it works. ARMCO Pipe comes in a wide range of diameters (6 to 36 inches) with wall thicknesses from 9/64- to 1/2-inch. You can choose the *one right size for the job.*

But that's only part of the story. Standard or special prefabricated fittings come welded to straight pipe runs. You save hours of assembly work and cut costs. When long lengths (up to 50 feet) can be utilized you save even more. Fewer flanges also mean less chance for leaks.

You can use ARMCO Welded Steel Pipe with confidence. It has a high safety factor against internal and external pressures. Rigid inspections assure freedom from surface defects.

Use ARMCO Steel Pipe for plant piping, water supply and force mains or wherever else you need dependable piping. Write us for prices and other data. Armco Drainage & Metal Products, Inc., Welded Pipe Sales Division, 2185 Curtis Street, Middletown, Ohio. Export: The Armco International Corporation.

ARMCO WELDED STEEL PIPE



Twin Disc's service program . . . established after an extensive study of the frequency-usage of repair parts . . . assures owners of Twin Disc equipment minimum downtime by stock-piling active parts as required in each Twin Disc outlet.

All Twin Disc Authorized Repair Parts Stations are adequately staffed with sales engineers and factory-trained service men—men with wide experience in the solution of power transmission problems and the servicing of Twin Disc Clutches and Hydraulic Drives.

For the right Twin Disc repair part, correctly installed, see your Authorized Twin Disc Repair Parts Station. TWIN DISC CLUTCH COMPANY, Racine, Wisconsin (Hydraulic Division, Rockford, Illinois).

SPECIALISTS IN INDUSTRIAL CLUTCHES SINCE 1918

N. Y., Flushing — Promenade Homes Corp., c/o Samuel Paul & Assoc., archts., 163-18 Jamaica Ave., Jamaica, 42 one family houses, Utopia Parkway, 184 St., 59 and 56 Aves. **$294,000.**

●**N. Y., Forest Hills** — Syndicate, c/o Arthur Weiser, archt., 240 Madison Ave., New York, Zone 16, six 6 story apartments along Yellowstone Blvd. between 65 Ave. and 66 Rd. **$4,420,000.**

●**N. Y., Hollis** — Holliswood Estates, c/o Joseph Unger, archt., 138-22 78 Ave., Flushing, ten 2 story bldgs. Marengo St., Pompeii and Dunton Aves. **$1,316,000.**

N. Y., Jamaica—Milled Realty Corp., c/o Morris Rothstein & Sons, 186 Joralemon St., Brooklyn, Zone 1, 21 one-family houses at 120, 121, 122, 123, 124 Aves. and 155 St. **$250,000.**

N. Y., New York—New York University, 100 E. Washington Square, plans by F. P. Platt & Bros., 101 Park Ave., Zone 17, school alterations at premises. **$250,000.**

●**N. Y., New York**—Rockefeller Institute for Medical Research, 66 St. and York Ave., plans by Coolidge, Shepley, Bulfinch & Abbott, 1 Court St., Boston, Mass., hospital and nurses and doctors residence, 1191-1268 York Ave. **$2,200,000.**

N. Y., New York—Workmens Circle Foundation, 159 Broadway, Zone 7, plans by George W. Swiller, 535 E. Tremont Ave., Zone 57, 3 story old age home, on site bounded by Grace, Hammersley, Ely and Burke Aves. **$850,000.**

●**N. C., Raleigh**—Sears, Roebuck Co., W. Arthington and S. Homan Sts., Chicago, Ill., retail store in Cameron Village, Cameron and Daniels Sts., Oberlin Rd. and Smallwood Dr. Approx. **$1,000,000.**

N. C., Winston-Salem—Wake Forest College, Reynolds Rd., humanities bldg. between main bldg. and library in south central portion of campus. **$900,000.** Jens F. Larson, 331 Madison Ave., New York, N. Y., consult. engr. CD 10/21/46—ENR 10/31/46.

●**O., Cincinnati**—Christ Church, Rev. N. Burrough, pastor, 318 E. 4 St., plans by Saarinen & Assoc., W. Longlake Rd., Bloomfield Hills, Mich., granite, stone church, remodel parish house and chapel. **$2,500,000.**

●**Pa., Brentwood**—South Hills Land Development, Inc., 429 Diamond St., Pittsburgh, plans by J. Kenneth Myers, 524, 4 Ave., Pittsburgh, 100 one and two story, brick veneer houses. **$1,000,000.**

●**Pa., Whitehall Boro**—J. C. Benson, 2901 Brownsville Rd., Pittsburgh, plans by C. V. Blezard, 433 Eureka St., Pittsburgh, 5 brick veneer, block 3 story bsmnt., apartments, three 40 x 80 ft. and two 40 x 130 ft. **$1,500,000.**

●**Tex., Corpus Christi**—Orville W. Eastland, Jones Bldg., plans by E. Dexter Hamon, Mod. Prod. Bldg., 166 rental housing units, **$1,000,000.** Frank Drought, 117 W. Pecan St., San Antonio, structural engr., H. Bartholomew & Assoc., 317 N. 11 St., St. Louis, Mo., landscape archts. CD 3/11.

Tex., Dallas — East Dallas Presbyterian Church, 4420 Swiss St., church, 9 acre site at Bob-O-Link Dr. **$400,000.** CD 12/5/45—ENR 12/27/45.

●**Tex., San Antonio**—Incarnate Word College, 4107 Broadway, student health service, **$750,000;** masonry library, **$500,000;** masonry gymnasium, **$650,000.** CD 2/25—ENR 3/10.

INDUSTRIAL BUILDINGS

●**Calif., Stockton**—MILL—Acala Cotton Mills, Inc., c/o J. Kessel, 3208 Pacific Ave., 16,000 spindle cotton textile mill. **$1,000,000.**

Conn., Hartford—GAS CONDUCTOR, etc.—Hartford Gas Co., 233 Pearl St., brick, concrete gas conductor, precipitator and sub-station bldgs., Front St., **$130,000.**

Fla., Miami Beach — GARAGE — Parking Facilities, Inc., c/o R. Robert Swarting, archt., 126 24 St., auto parking garage. Over **$250,000.**

●**Ill., Decatur**—PLANT—A. E. Staley Mfg. Co., Decatur, plant. **$1,000,000.**

Ia., Des Moines — GRAIN ELEVATORS — Farmers Grain Dealers Assn., 18 and Vine Sts., grain elevator addn. **$400,000.**

Ia., Des Moines—PLANT—Iowa Farm Bureau Federation, Farm Bureau Bldg., fertilizer plant. **$850,000.**

Kan., Kansas City—WAREHOUSE—Kansas City Wholesale Grocery Co., 1208 W. 12 St., Kansas City, warehouse. **$100,000.**

Ky., Shelbyville—WAREHOUSE—Doty Mosley, Frankfort, Lee R. Walker and Raymond Mitchell, Owensboro, Irvin Hakemore, Lawrenceburg, auction warehouse, on U. S. 60. **$100,000.**

La., Houma—SALES and SERVICE—George Broussard, Inc., 510 Lafayette St., auto sales and service bldg., **$100,000.**

N. Y., Brooklyn—FACTORY—Bartley Realty Corp., 4201-23 Avenue H, plans by Seelig & Finkelstein, 153 Pierrepont St., Zone 2, 2 story factory alterations, 4123 Avenue H. **$115,000.**

●**Pa., Elrama**—POWER STATION—Duquesne Light Co., 435 6 Ave., Pittsburgh, power station. **$28,000,000.** C. T. Sinclair, c/o owner, ch. engr.

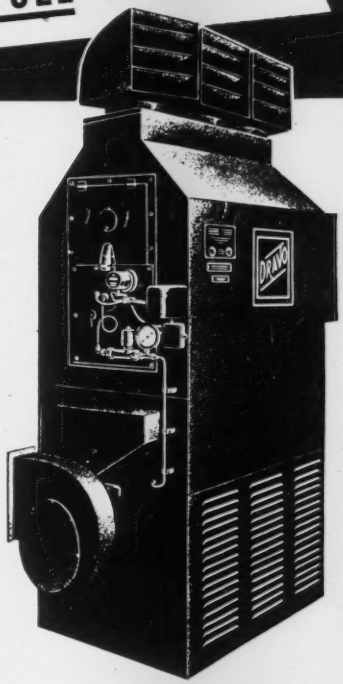
Pa., Pittsburgh—SHOP—Union R. R. Co., F. H. Smith, ch. engr., East Pittsburgh, steel tr., diesel shop bldg., Hall Station. **$350,000.**

(Continued on page 150)

DON'T LET "TRADITION"

Double YOUR HEATING INVESTMENT

DRAVO *Counterflo* HEATERS CUT SYSTEM COSTS and FUEL COSTS!



Why pay toll to tradition by installing an elaborate wet-type heating system in structures having large open areas . . . when Dravo *Counterflo* Heaters can do the job for a fraction of the cost of *installation* . . . and a fraction of the cost of *operation?*

No expensive piping . . . these 80 to 85% efficient heaters "manufacture" the warmth right in the area where it is used. *No involved installation* work—the 100-150 foot air-throw warms the working-zone of large open areas without duct work. *No delays* . . . the heaters are ready for immediate delivery, require only power, fuel and vent connections—and they're ready to go! *No maintenance headaches* . . . the rugged, mill-type construction, the stainless steel combustion chamber, the top-drawer engineering all contribute to long, attention-free service. *No fuel worries* —heaters use either oil or gas, and can be readily converted from one to the other. *No uncertainty*—AGA approved and UL listed.

Here's a good point to remember. Practically all heating systems *end up* by warming the air. Dravo *Counterflo* Heaters reduce cost and eliminate waste and complication, by warming the air to *begin with.* The biggest names in American industry are listed on the roster of enthusiastic users. Let us send you a list of typical customers, so you can verify heater performance for yourself. For the detailed story of construction, operation, installation and results, ask for Bulletin AC-523-1

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Body Illustrated: Model RB-70, standard 7 cu. yd. rock body, specially constructed for quarry and rock work. Made in all capacities. Mounted over standard double-lift arm type under body hoist or telescopic hoist, depending on capacity and use.

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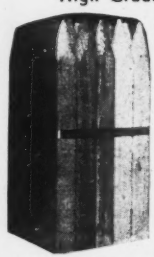
SURVEYOR STAKES
Stained Yellow Bound with Steel Strapping



	Per 100	In 1000 lots Per 100
1x2—12"	$5 05	$4 60
1x2—15'	5 15	4 65
1x2—18'	5 25	4 75
1x2—24'	6 20	5 65
1x2—36'	8 80	8 00
2x2—12	6 50	5 90
2x2—15'	8 15	7 00
2x2—18'	8 70	7 90
2x2—24'	10 45	9 50
2x2—36'	15 00	13 65

Prices net F.O.B. Cumberland, Md.
BUCHANAN LUMBER CO.
CUMBERLAND, MD.

(Continued from page 148)

●**Pa., Pittsburgh**—PLANT etc.—Western Electric 910 River Ave., 2 story, brick, concrete repair plant and warehouse. **$5,000,000.**

S. D. Nunda—GRAIN ELEVATOR—Nunda Co-operative Assn., Nunda, grain elevator. **$500,000.**

Tenn., Nashville—WAREHOUSE—Guardian Life Insurance Co., c/o Hart, Freeland & Roberts, archts., 3rd Natl. Bank Bldg., warehouse. **$250,000.**

Va., Danville — WAREHOUSE — Piedmont Warehouse Corp., Danville, rebuilding warehouse. Approx. **$100,000.**

Wash., Seattle—GARAGE—Ten Co., c/o J. Blume, University Chev. Co., E. 45 St. and Roosevelt Way, plans by Naramore, Bain, Brady & Johanson, Dexter Horton Bldg., deck parking lot garage. **$100,000.** CD 4/26/46—ENR 5/16/46.

●**Philippines, Iloilo** — PLANT — Philippine Portland Cement Co. Inc., Manila, cement plant. **$1,000,000.**

●**Que., Sherbrooke**—PLANT—E. Gagnon, 3999 Rivard St., Montreal, plans by J. Damphousse, 937 Laurier Ave., Montreal, 100x200 ft. plant. **$1,000,000.** CD 2/21—ENR 3/10.

UNCLASSIFIED

Arkansas—RURAL DISTRIBUTION LINES—Petit Jean Electric Co-operative, Clinton, 234 mi. rural distr. lines, other facilities, Conway Co., etc. **$920,000.** Southwest Electric Engineers, Jonesboro, consult. engrs. CD 3/18.

Illinois—RURAL DISTRIBUTION LINES—M. J. M. Electric Co-operative, Inc., Carlinville, addnl. rural distr. lines, extens. and sys. imprvs., Macoupin, Jersey and Montgomery Counties. **$310,000.**

●**Illinois**—RURAL DISTRIBUTION LINES—Illinois State-Wide Power Co-operative, c/o Abe Beerker, state mgr., Illinois Electric Co-operative Assn., Springfield, 3,000 mi. rural distr. lines, generating plant, on Illinois River near Beardstown and on Wabash River, at Mayville. **$3,000,000.**

Iowa—RURAL DISTRIBUTION LINES—Hancock Co. Rural Electric Co-operative, Garner, rural distr. lines, Hancock Co. **$190,000.** Brown Eng. Co., K. P. Bldg., Des Moines, consult. engr. CD 5/12—ENR 6/3.

Ia., Dubuque—DRIVE-IN THEATRE—Tri States Theatre Corp., G. Ralph Branton, genl. mgr., 800 Paramount Bldg., drive-in theatre, Hy. 386, near Sageville Rd. Approx **$100,000.**

La., Denham Springs—NATURAL GAS SYSTEM—City, P. T. Jones, mayor, **$170,000** bond election May 17, natural gas sys. exten. Barnard & Burk, Triad Bldg., Baton Rouge, consult. engrs.

Md., Laurel — RACE TRACK — Maryland Jockey Club, Pimlico, Baltimore, Laurel Race Track addns., alterations **$750,000.**

Missouri—RURAL DISTRIBUTION LINES—Barry Electric Co-operative, Cassville, sys. imprvs., completion construction, Barry Co. Approx. **$210,000.**

Nebraska—RURAL DISTRIBUTION LINES—Loup Valley Rural Electric Membership Assn., Ord., 333 mi. rural distr. lines, Valley, Greeley, Wheeler, Garfield and Loup Counties **$300,000.** Raymond H. Reed & Co., Columbus, engr.

O., Cincinnati—STADIUM AND FIELD—Bd. Educ., 211 W. Court St., plans by Hake & Hake, engrs. and archts., 2400 Gilbert Ave., concrete stadium and field, parking areas, chain link fence, pipe railings, etc. **$400,000.**

Oklahoma—RURAL DISTRIBUTION LINES—Verdigris Valley Electric Co-operative, Collinsville, 264 mi. rural distr. lines and sys. imprvs., Rogers Co. **$700,000.**

●**Oregon**—RURAL DISTRIBUTION LINES—Coos-Curry Electric Co-operative, Coquille, 35 mi. rural distr. lines, 143 mi. distr. lines and sys. imprvs., Coos Co. **$1,000,000.**

Texas—RURAL DISTRIBUTION LINES—Lamar County Electric Co-operative Assoc., Paris, 102 mi. rural distr. lines, sys. imprvs. and headquarters facilities, Lamar Co. **$245,000.**

Wisconsin—RURAL DISTRIBUTION LINES—Adams-Marquette Electric Co-operative, Friendship, 87½ mi. rural distr. lines and sys. imprvs., Adams Co. **$546,000.**

Wisconsin—RURAL DISTRIBUTION LINES—Vernon Electric Co-operative, Westby, 58 mi. rural distr. lines, 7½ mi. transmission lines, sys. imprvs., and completing Tri-County Co. proj. constr., Vernon Co. **$537,000.** CD 6/5/47—ENR 6/26/47.

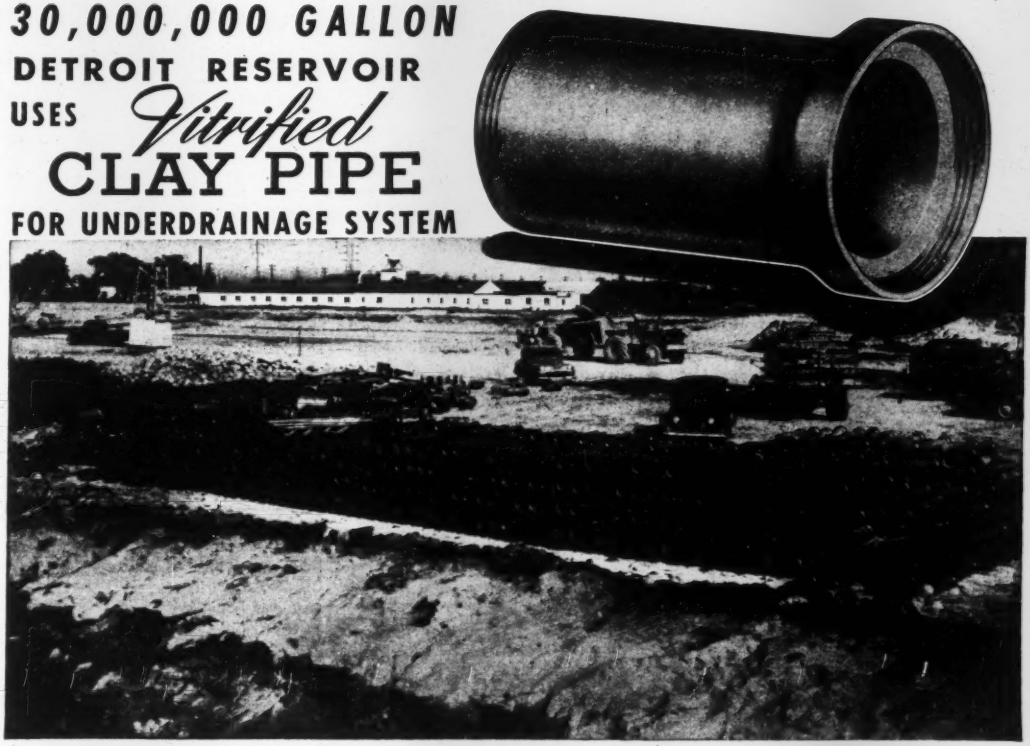
Wyoming—PIPELINES—Frontier Refining Co., Boston Bldg., Denver, Colo., pipelines originating in Mush Creek and Lodge Creek fields in northeastern Wyo. and connecting with Rocky Mountain Gas Co. lines at Lance Creek. **$600,000.**

●**Wyoming**—OIL PIPELINE—Plains Pipe Line Co., Newcastle, oil pipeline serving fields in Western and Niobrara Counties. Approx **$1,500,000.**

●**Alberta**—RAILROAD—Canadian Pacific Ry., J. E. Armstrong, ch. engr., Windsor Station, Montreal, Que., railway line from Ford-Highwood Collieries to Okotoks. Approx **$3,500,000.**

●**British Columbia**—POWER DEVELOPMENT—British Columbia Power Comn., 918 Government St., Victoria, power development, Quesnel River, Little Canyon. **$5,500,000.**

30,000,000 GALLON DETROIT RESERVOIR USES *Vitrified* CLAY PIPE FOR UNDERDRAINAGE SYSTEM



Built without piling, the underdrainage system for Detroit's new Northeast Station Reservoir is designed to prevent floating of the reservoir, which measures 451 ft. by 551 ft. with an average depth of 20 ft. Bryant & Detwiler, Detroit, Mich. — general contractors. Loselle Construction Co., Wyandotte, Mich. — sub-contractors for excavation and for installation of Vitrified Clay Pipe underdrainage.

VITRIFICATION under modern firing methods, with temperatures and time scientifically controlled, welds nature's most enduring, chemically inert raw material into strong, non-corrosive, rust-proof, everlasting Clay Pipe. In no other pipe do you get all the advantages of *complete fusion by fire.* No wonder Vitrified Clay Pipe is universally preferred for sewerage and drainage projects.

Vitrified CLAY PIPE

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522 First National Bank Bldg., Atlanta 3, Ga.
703 Ninth & Hill Bldg., Los Angeles 15, Calif.
1105 Huntington Bank Bldg., Columbus 15, O.

3-bin grain storage silo of Burke Brewery, Inc., Long Island City, N. Y. Outside dimensions are 30'2"x15'4" with 8" walls of concrete made with Lehigh Early Strength Cement. Height of 1st cutback, 57'2" 2nd, 68' . . . 3rd, 82'3".

CONTRACTOR—Wm. B. Neill, Inc., 30 Vesey St., New York, N. Y.

DEALER—Supro Building Products Co., 4816 70th St., Woodside, N. Y.

JANUARY 17, 1949

JANUARY 19, 1949

JANUARY 22, 1949

from start to finish in less than 5 days with LEHIGH EARLY STRENGTH CEMENT

Here's a good example of how speed can be put in a job by using Lehigh Early Strength Cement. At 12:30 P.M. on Monday, January 17, 1949, the first pour was made for the 3-bin concrete silo of the Burke Brewery, Long Island City, N. Y. Less than 5 days later on Saturday at 10:30 A.M. the walls of the 82'3" high structure were topped out.

Weather conditions were none too good. Typical winter temperatures prevailed. And during the last two days of pour, there was intermittent rain, sleet and snow. Yet the work went on.

Save time . . . save money . . . use Lehigh Early Strength Cement for all construction where close building schedules must be maintained. Our Service Department will be glad to help you with your specific problems.

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CONSTRUCTION REPORTS—Second Section

Third Section Construction Reports on page 164

WATER SUPPLY

BIDS ASKED

April 18

Mass., Tewksbury—Commonwealth of Mass., P. A. Tompkins, comr., P. Welfare, Ford Bldg., 15 Ashburton Pl., Boston, WW sys. imprvs., State Proj. C-109. Contr. 1, Tewksbury State Hospital. Plans deposit $10., Weston & Sampson, 14 Beacon St., Boston, engrs.

N. Y., New York—Comr. Water, Supply, Gas & Electricity, Municipal Bldg., Zone 7, watermains, appurtenances, Stronghurst, 79, 80 and 81 Aves., and 239, 258, 259, 268 and 269 Sts., Queensboro. Plans deposit $1.

April 19

Kan., Hays—V. Wells, city clk., City Hall, water supply pipelines, well houses, appurtenances. Plans deposit $15. Wilson & Co., 223 N. Santa Fe St., Salina, engrs. CD 9/22—ENR 10/14.

O., Akron—Dpt. Pub. Service, M. L. Davis, dir., Municipal Bldg., Contr. 403-A, trestle foundations and 60 in. concrete pipelines for Akron water purification and pumping plant. Plans deposit $10. Parsons, Brinckerhoff, Hall & Macdonald, 51 Broadway, New York, N. Y., engrs. CD 11/17-47—ENR 11/20/47.

LOW BIDDERS

●**Calif., Los Angeles**—City, Dpt. Water & Power, 207 S. Broadway, Apr. 4, Franklin-Baldwin Trunk lines, rein.-con. pipe, from American Pipe & Constr. Co., South Gate, **$2,884,195**; Baldwin Outlet Line, rein.-con. pipe, from United Concrete Pipe Corp., Baldwin Park, **$2,088,355**. CD 3/10—ENR 3/17.

SEWERS, WASTE DISPOSAL

BIDS ASKED

April 18

Mass., Weymouth—Town, Bd. Sewer Comr., J. W. Field, secy., Town Hall, 6,825 ft. 18- to 30- in. sewers, railroad tunnel, pumping and appurtenant work, Metcalf & Eddy, 1300 Statler Bldg., Boston, engrs. CD 2/25/46—ENR 3/7/46.

April 20

Md., Baltimore—Mayor & City Council, City Hall, Sect. 1, brick, concrete Brooklyn Sewage Pump. Station, Sect. 2 100 lin. ft. 24 and 30 in. vitr. pipe and masonry sewers, 300 l.n. ft. 24 to 36 in. c.i. pipelines, etc. Plans deposit $5. J. J. Hunt, sewerage engr. CD 1/27/44—ENR 2/10/44.

Wis., Granton—Village, sewers, sewage disposal plant **(A)** 9,296 ft. 8 and 10 in. sewers, 150 ft. 8 in. c. i. pipe, 29 manholes, eighty-five 4 in. wye's, 2,800 ft. 4 in. and 170 ft. 8 in. house connections, school house line, 1,150 ft. 8 in.; 3 manholes, 100 ft. siphon **(B)** sewage treatment plant; **(C)** sewage treatment plant equip. $82,000. Plans deposit $15. Davy Eng. Co., 502 Main St., La Crosse, engr.

April 21

Ga., Eatonton—City, Eatonton, outfall lines, two 206,000 g.p.d. treatment plants, etc. Plans deposit $25. Harwood Beebe Co., Spartanburg, S. C., engr.

April 26

Calif., Los Angeles—Bd. Supervs. Los Angeles Co., 501 Hall of Records, 2.3 mi. 8 in. vitr. clay sanitary sewers in Emerson Pl., Wilmar, $63,200; 2.84 mi. 8 and 10 in. vitr. clay sewers, Watcher St., Bell Gardens, $58,100; rein.-con. storm drain, appurtenances, Michlinda St., Arcadia, approx. $50,000. C. E. Arnold co. engr. and surv. CD 3/18—ENR 3/31.

LOW BIDDERS

●**Tex., Houston**—M. H. Westerman, secy., Mar. 30, enlarging Northside Sewage Disposal Plant, incl. sludge plant, from Rust Engr. Co., **M. & M. Bldg., $1,041,081.** Est. $1,000,000. CD 3/15—ENR 3/17.

CONTRACTS AWARDED

●**N. Y., Brooklyn**—Dpt. P. Wks., Municipal Bldg., New York Zone 7, Contr. 4, pump and powerhouse at Owls Head sewage treatment works, bounded on north by Long Island R. R., on south and west by New York Bay and east by Shore Parkway, to Thompson Starrett Co., Inc., 444 Madison Ave., New York, Zone 22, **$3,748,240*****Contr. 11, Electrical Engr., to Plymouth Electric Constr. Co., Inc., 21 E. 40 St., New York, Zone 17, **$748,865.** CD 1/10—ENR 1/13.

BRIDGES

BIDS ASKED

April 18

N. Y., New York—President Manhattan Boro, Municipal Bldg., Zone 7, foundations for viaduct overpasses between Franklin D. Roosevelt Dr. and 1st Ave. at E. 44 and E. 48 Sts., etc. for United Nations Proj., Contr. 162. Plans deposit $25. Extended date. CD 4/4—ENR 4/7.

LOW BIDDERS

Connecticut—State, G. Albert Hill, comr., State Office Bldg., Hartford, Apr. 4, 36 ft. span concrete, steel bridge over Whiting River constr. 5,562 ft. pavement on U. S. Rt. 44, North Canaan, from Heney-Lundgren Co., Shrewsbury, Mass., **$177,664**; 2 rein.-con. 50 ft. span bridges over Little River elimination of Bank St. Curve, Seymour, from Marianni Constr. Co., 222 Forbes Ave., New Haven, **$309,369.** CD 3/25—ENR 3/31.

●**Louisiana**—State Hy. Dpt., Baton Rouge, Apr. 6, steel, concrete, superstructure 1.366 mi. Calcasieu river bridge, State Rt. C-2109, S. P. 3-30-03, F. A. P. FI 35 (17), Lake Charles, Calcasieu Parish, from Virginia Bridge Co., 821 Madison Ave. N. E., Roanoke, Va., **$3,245,022.** CD 2/2—ENR 2/10.

CONTRACTS AWARDED

●**Massachusetts**—Mystic River Bridge Auth., E. A. Brest, chn., 6 Beacon St., Boston, c. conc. paving superstructure, Mystic River Bridge, Charlestown and Chelsea, to Merritt, Chapman, & Scott Corp., 79 Milk St., Boston, Contr. 8 **$1,463,200,** Contr. 8A **$589,900,** Contr. 8B **$950,-300.** Grand total $3,002,500. Bids 3/24, awarded 3/31. CD 3/31—ENR 4/7, under LB.

●**New York**—Bureau Contracts & Accounts, Albany, bridge, 4.26 mi. Lake Ontario State Parkway and 2.14 mi. adjacent service roads, Monroe Co., to S. J. Groves & Sons, Co., Nedrow, **$1,625,115.** Bids 2/16. CD 2/18—ENR 2/24, under LB.

STREETS AND ROADS

BIDS ASKED

April 18

Mass., Winchendon—Town, Allan J. White, chn., Bd. P. Wks., Town Hall, asph. and tar road materials, various streets. Over $50,000.

N. Y., New York—President Manhattan Boro, Municipal Bldg., Zone 7, asph. repaving 5 Ave. 135 to 137 Sts., etc., ●contr. 465. Extended date. CD 4/4—ENR 4/7.

April 20

Minn., Fairfax—Village, A. R. Quast, clk., Village Hall, 16,000 cu. yd. excav., 28,000 lin. ft. concrete curb and gutter, 58,500 sq. yd. 1½ in. stabilized gravy. base and 1½ in. bit. top, 129,-000 sq. ft. sidewalk, $50,000. Plans deposit $10. L. E. Lane, Willmar, engr.

April 21

Fla., Jacksonville—City, City Hall, Jacksonville, asph. paving Julia St. from north property line of Church St. to south property line of State St. and incl. concrete parking strip with integral curb complete in place. Capt. W. E. Sneeden, Engineers Bldg., city engr. CD 1/17/45—ENR 2/8/45.

Ia., Newton—Bd. Supervs. Jasper Co., Newton, 12,000 cu. yd. gravel, 15,000 tons crushed stone, secondary roads. Approx. $50,000. Ray McMurroy, co. engr.

●**Virginia**—Pub. Roads Admin., 1440 Columbia Pike, Arlington, c. conc. 2 mi. Proj. 6A17, George Washington Memorial Parkway, Arlington Co. Plans deposit $10.

Late in April or May

Ill., Grayville—City, City Council, City Hall, c. conc. curb and gutter, grav. or crushed stone, base course, and bit. tr. surf. various arterial streets, approx. $128,000. Marbry & Johnson, Inc., 2094½ N. Cross St., Robinson, engr. CD 3/18—ENR 3/31.

PROJECTS COVERED

Projects—By Size

Construction projects here reported cover the United States and Canada, are of these minimum sizes or larger: water supply, earthwork, waterways $28,000; other public works $50,000; industrial buildings $68,-000; other buildings $250,000.

Classes of Construction

(Name in order of Listing)

Water Supply	Latin America
Sewers, Waste Disposal	Public Buildings
Bridges	Commercial Buildings
Streets & Roads	Industrial Buildings
Earthwork, Waterways	

Unclassified

Stages Reported

PROPOSED WORK: Including appointment of engineers or architects.

BIDS ASKED (new announcements only). For full calendar, see also preceding issues of ENR.;

LOW BIDDERS: On jobs below $500,000 value all low bidder news will be the final reports published on the projects involved except where award is not made to the low bidder. In this case, a supplementary contract award report will be published.

CONTRACTS AWARDED: Except awards to low bidders previously reported in low bidder stage.

Dates shown are of issue in which last previous report was published.

Symbols and Abbreviations Include:

♦	Federal Government
●	Project of $1,000,000 or over.
ENR	Engineering News-Record
CD	Engineering News-Record Construction Daily

May 3

†Ohio—U. S. Eng., Huntington 18, W. Va., surf. entrance roads for Beach City, Charles Mill, Clendening, Dover, Mohawk and Pleasant Hill Dams, Muskingum River Reservoirs, Serial No. Eng-46-022-49-123. CD 11/16—ENR 11/18, under LB.

LOW BIDDERS

Connecticut—State, G. Albert Hill, comr., Hartford, Apr. 4, b. conc. resurf. 13,028 ft. Merritt Parkway, from Peckham Road Corp., White Plains, N. Y., **$83,987;** c. conc. 4 mi. Wilbur Cross Parkway from Derby Ave., Orange to West Rock Tunnel, New Haven, from Gammino Constr. Co., 729 Valley Rd., Providence, R. I., **$599,289.** CD 3/25—ENR 3/31.

●**Kentucky**—State Hy. Dpt., Frankfort, Apr. 1, bit. surf. Class I, 9.039 mi. S. P. Group 1 (1949), McCracken Co., from Barber Paving & Eng. Co., 7 S. Dearborn St., Chicago, Ill., **$96,671***** bit. conc. Class I, 8.077 mi. S. P. Group 2 (1949), Ballard and Carlisle Counties, from White Constr. Co., 1831 W. Columbia St., Chicago, Ill., **$79,823*****bit. surf. Class C-1, 22.375 mi. S. P. Group 3 (1949), Muhlenberg and Todd Counties, from Ellis, Kelly & Co., Owensboro, **$91,655*****bit. surf Class I, 22.863 mi. S. P. Group 4 (1949), Henry, Oldham and Trimble Counties, from H. K. Williams, 4141 Park Blvd., Louisville, **$111,723*****bit. surf. Class C-1 and A-2 seal, 18.393 mi. S. P. Group 5 (1949), Butler and Grayson Counties, from J. Smead Yager, 315 High St., Frankfort, **$104,083*****bit. surf. Class I and rock asph. 26.137 mi. S. P. Group 6 (1949), Nelson, Spencer and Washington Counties, from Carey Constr. Co., 318 Citizens Bank Bldg., Lexington, **$163,650*****bit. surf. Class I and rock asph. 10.193 mi. S. P. Group 7 (1949), Boone, Campbell and Kenton Counties, from Asphalt Paving Co., Covington, **$103,688*****bit. surf. 21.822 mi. S. P. Group 8 (1949), Casey Co., from L. P. Cavett Co., Buckland, O., **$150,515*****bit. surf. Class C-1, 10.848 mi. S. P. Group 9 (1949), Pike Co., from H. C. Adams, 968 Delaware Ave., Lexington, **$62,207*****bit. surf. 37.15 mi. S. P. Group 10 (1949), Menifee and Morgan Counties, from Allen-Cofell Co., Inc., Winchester, **$164,348*****bit. surf. Class F, 3.252 mi. S. P. Group 11 (1949), McCreary and Whitley Counties, from Middle West Roads Co., Noblesville, Ind., **$240,279***** reconstruction and traffic bound surf., river gray 3.176 mi. Old Boone Rd., RS 39-133; Gallatin Co., and 6.24 mi. Old Boone and Ross Rds., RS 39-133 and RS 39-153 (combination), Gallatin Co., from I. H. Hardin Co., Bedford, **$54,128** and **$87,041** respectively***traffic bound limestone 6.18 mi. Hazard Relief Rt. Rd., U 138 (14) 97-542, Perry Co., from Nally & Hallard, Inc., Bardstown, **$304,961.** CD 3/9—ENR 3/17.

Maryland—State Hy. Dpt., Baltimore, Mar. 22, c. conc. 1.241 mi. dual hy., grade separation, structures, approaches at Ridge Rd., Contr. AA-368-6-358, Anne Arundel Co., from Carozza-Hamill & Co., 10 W. 25 St., Baltimore, **$851,233.** CD 3/16.

New York—President Queens Boro, 129-55 Queens Blvd., Kew Gardens, Zone 15, paving Centre and George Sts. and Queens Blvd., from Mac Asphalt Constr. Corp., 33-75 Lawrence St., Flushing, **$51,229** and **$91,361** respectively. CD 3/23.

CONTRACTS AWARDED

N. J., Newark—City, City Hall, paving ½ mi. Magazine St., to Standard Bitulithic Co., foot of 16th St., **$100,974**; constructing 0.4 mi. 36th Ave. (West), to American Paving Co., Bessemer St., **$115,586.** CD 12/22/43—ENR 12/30/43.

Vermont—State Hy. Dpt., Montpelier, construct road, South Burlington and Burlington, to W. H. Hinman Inc., North Anson, Me., **$381,-470.** Bids 3/18, awarded 3/25.

●**Wisconsin**—State Hy. Comm., Madison, c. conc. 19.61 mi. Peeksville-Morse and Morse-Mellen Rd., S. T. Hy. 13, Contr. 1, Proj. F 04-6 (26) and F 04-6 (27), to J. R. Griffith Co., 1500 Ninth St., Racine, **$625,910*****bit. 9.519 mi. South County Line-West Morgan Ave. Rd., U. S. Hy. 41, Contr. 1, Proj. T 02-2 (1), Milwaukee Co., to Payne & Dolan of Wisconsin, Inc., 735 N. Water St., Milwaukee, Zone 2, **$614,255*****concrete masonry-asph. 1.298 mi. West Fond du Lac Ave., S. T. Hy. 55, Proj. U-027-1 (7) to White Constr. Co., 2543 W. Greves St., Milwaukee, Zone 3, **$535,-468.** Grand total $1,775,634. CD 4/4, under LB.

EARTHWORK, WATERWAYS

BIDS ASKED

April 19

N. Y., New York—Comr. Parks, at office Dpt. Parks, Arsenal Bldg., Central Park, 64 St. and 5 Ave., Zone 21, repairing timber fender sys. along bulkhead between E. 63 and 64 Sts., Franklin D. Roosevelt Dr., Contr. No. M-108-149. Plans deposit $5.

†North Carolina, Virginia and Florida—U. S. Eng., 308 Customhouse, Wilmington, dredging channel from Back Sound to Lookout Bight, N. C. and Atlantic Intracostal Waterway between Norfolk, Va. and the St. Johns River, Fla., Serial No. Eng-31-075-49-54.

South Carolina—State Hy. Dpt., Columbia, 341 ft. creosoted pile, treated timber groins on beach at Folly Island, S. C. Docket 10.322; 869 ft. creosoted timber pile and treated timber groins on beach at Edisto Island, S. S. Docket 10.323, both Charleston Co.; 3 creosoted timber pile and treated timber groins, totaling 731 ft. on beach at Pawley's Island, S. C. Docket 22.253, Georgetown Co.

LARGEST RUBBER HOSE

Engineered by Raybestos-Manhattan

A prominent southern chemical plant needed an unusually large, flexible, corrosive resisting line to discharge slurry through a narrow underground tunnel. It could be installed only by bolting together and drawing the entire line through – a tremendous strain on hose and flanges. The operation represented a large investment, a vital part of the process. They could not afford to take chances on anything but properly designed and engineered hose.

They gave the problem to Raybestos-Manhattan hose engineers. The result was the design and manufacture of what is believed to be the biggest rubber hose ever made in the long lengths required.

Pictured here are twelve 25′ lengths of 18″ I. D. Condor Flexible Rubber Pipe being checked by Raybestos-Manhattan engineers before shipment. One length of this huge hose weighs over half a ton . . . 1,425 lbs. Manhattan has made hose of larger diameters but, considering length, this is the biggest hose in its history.

If you have hose requirements, you can't go wrong by going to the men who are proved engineers of hose . . .

Keep Ahead With Manhattan

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RM **RAYBESTOS-MANHATTAN, INC.**

Manufacturers of Mechanical Rubber Products • Rubber Covered Equipment • Radiator Hose • Fan Belts • Brake Linings • Brake Blocks • Clutch Facings • Packings • Asbestos Textiles • Powdered Metal Products • Abrasive & Diamond Wheels • Bowling Balls

†South Carolina—U. S. Eng., Custom House, Charleston, center boat slip of the Custom House wharf and the U. S. Navy Fleet Landing, Charleston Harbor, Serial No. Eng-38-081-49-23.

April 20

Fla., Pensacola—Santa Rosa Island Auth., c/o R. G. Patterson, engr., 615 S. Palafox St., grading 0.5 mi. between Station 24 plus 20 and Station 54 plus 00, near Pensacola Beach. Plans deposit $10.

†Illinois—U. S. Eng., 826 U. S. Court House and Custom House, 1114 Market St., St. Louis 1, Mo., levee repair, Big Swan Drainage and Levee Dist., and Walnut Creek Private Levee, Scott Co., Serial No. Eng-23-065-49-118.

April 27

Texas — State Hy. Comm., Austin, dredging, stockpiling shell material adjacent to Nueces Bay Causeway on Hy. US 181, C. 101-6-9, Nueces Co. $160,000. D. C. Greer, c/o owner, engr.

LOW BIDDERS

●**†Washington**—Bureau Reclamation, Dpt. Interior, Bldg. 1-A, Denver, Federal Center, Denver, Colo., April 1, completing feeder canal proj. 1.5 mi. earthwork, concrete lining and structures, relocation 1.25 mi. railroad, and construct dam to block upper Grand Coulee 3 mi. southwest of Grand Coulee Dam, North barrier for 27 mi. equalizing reservoir of project irrigation sys., Columbia Basin Proj., Grant Co., Spec. 2586 from J. A. Terteling & Sons, Inc., 4011 Fairview Ave., Boise, Idaho, **$2,730,009** and **$1,988,717** respectively. CD 3/2—ENR 3/10.

CONTRACTS AWARDED

†Michigan — U. S. Eng., 609 Federal Bldg., Detroit, Zone 26, dredging channel from mouth of Saginaw River, to natural deep water in Saginaw Bay, Bay Co., to Dunbar & Sullivan Dredging Co., 2312 Buhl Bldg., Detroit, 53c. per cu. yd. Est. $105,313. Bids 3/22, awarded 4/5. CD 2/23—ENR 3/10.

AIRPORTS AND AIRBASES

BIDS ASKED

About April 26

†Canal Zone—AIRPORT—U. S. Eng., Box 5043, Ancon, Canal Zone, imprv. drainage facilities, Albrook Air Force Base, Serial No. Eng-96-505-49-18. Plans deposit $15.

LOW BIDDERS

Ind., Evansville—TERMINAL BLDG.—Bd. Aviation Comrs., Evansville, Mar. 28, terminal bldg. addn., from Huber, Hunt & Nichols, P. O. Box 128, Indianapolis, **$843,677**. Est. $400,000. Jack Kinkel, 14 Court Bldg., archt. CD 3/16.

Ia., Fort Dodge—AIRPORT IMPRVS.—City, City Hall, clearing, grading, marking airport from D. R. Burch, 1718 Park Ave. S. E., Cedar Rapids, **$84,037*****storm drainage sys., from R. O. Anderson Co., Des Moines, **$53,121*****runway paving, from Western Constr. Corp., Warnock Bldg., Sioux City, **$209,184**. CD 3/27/47—ENR 4/17/47.

Mass., North Adams—AIRPORT IMPRVS.—City, Mayors Office, City Hall, Mar. 30, Harriman Airport imprvs., from Patrica Constr. Co. Inc., 534 West St., Pittsfield, **$153,879**. CD 3/15—ENR 3/17.

†N. J., Lakehurst—AIRPORT—Pub. Wks. Office, U. S. Naval Base, Phila., Pa., Mar. 23, repairing, relocating, regrading, removing, trackwork and incidental work at railroad station, Naval Air Station, Spec. 20555, from W. C. Shaner & Son, 2029 N. 62 St., Phila., Pa., **$79,961**. CD 3/17.

†N. Y., White Plains—AIRPORT—U. S. Eng., 120 Wall St., New York, Zone 5, Mar. 31, Air National Guard facilities at Westchester County Airport, Army Water Supply, Harvey Constr. Co., Inc., Railroad Ave., Ossining, **$553,491**. CD 3/3—ENR 3/10.

●**†Alaska**—U. S. Eng., Pier 51, Seattle, Wash., Apr. 5, outside utilities at Eielson Air Force Base, Mile 26, Proj. S 35-507-49-13, from Selid Constr. Co., Fairbanks, **$197,446**. CD 2/25—ENR 3/10***airfield lighting at Eielson Air Force Base, Mile 26, DEF No. 4, from Reed & Martin, Fairbanks, **$703,000**. CD 2/14—ENR 2/17***temporary heating plant addn., steam and water distr. and sewage collections sys. extens. with necessary utilities, electrical distr. sys. and sewage lift station extens., completing construction utilities and outfall sewer line and fine grading and landscaping at Ladd Air Force Base, Fairbanks, DEF-6, from R. and M. Constr. Co., Fairbanks, **$1,997,500*****power plant at Ladd Air Force Base, DEF 7, from Morrison-Knudsen Co. Inc., and Peter Kiewit Sons Co., Hoge Bldg., Seattle, Wash., **$3,000,000**. CD 2/14—ENR 2/17.

CONTRACTS AWARDED

●**Pa., Pittsburgh**—TERMINAL—Comrs., Allegheny Co. County Office Bldg., 5 story, 90x560 ft., brick terra cotta, tile, limestone, granite terminal bldg. at greater Pittsburgh Airport, to Dick Constr. Co., 2532 Library Rd., **$2,378,000**. Bids 3/29. CD 3/17—ENR 3/24.

FOREIGN

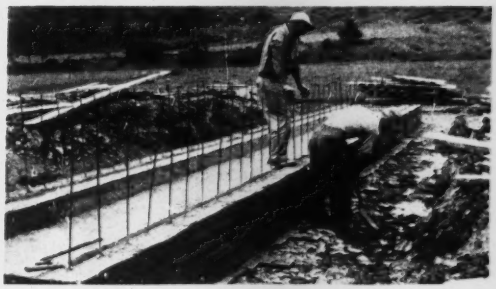
Tanganyika, Dar es Salaam—Territory Government of Tanganyika, Dar es Salaam, receiving bids constructing drainage sys., 20 mi. 24 in. sewers. H. Humphreys & Sons, 17 Victoria St., Westminster, London, England, engrs.

(Continued on page 156)

6-Mile Paving Job on N.Y. Route 17

Here come the dirt movers. Grading team, made up of four scrapers and two 'dozers, starts on the day's work.

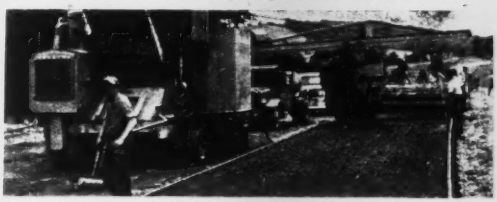
New York State Highway Department engineers go into a huddle. Left to right: Thomas J. Cornell, bridge engineer; John C. Crawford, detail engineer; and R. P. Berfureau, engineer in charge.



Bethlehem Reinforcing Bars shown in place in culvert. Project used 25 tons of reinforcing steel.

In order to make Route 17 straighter and safer, the New York State Highway Department authorized six miles of new construction between Jasper and Addison. The new highway is two lanes wide, and is relatively free of turns and grades. It was constructed by Potter DeWitt Corp., of Pavilion, N. Y. Steel items supplied by Bethlehem were bar mats, reinforcing bars and cable guard rail.

Easy does it! Workmen carefully gauge distance to road form before placing Bethlehem Bar Mat.



Batch-bucket shuttles back and forth endlessly, as it drops new concrete over Bethlehem Bar Mats.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by
Bethlehem Pacific Coast Steel Corporation
Export Distributor: Bethlehem Steel Export Corporation

STEEL FOR HIGHWAYS

Dowel Units • Reinforcing Bars • Guard Rail Posts
Bar Mats • Guard Rail • Wire Rope and Strand
Hollow Drill Steel • Spikes • Bolts and Nuts • Pipe
Sheet- and H-Piling • Fabricated Structural Steel
Timber Bridge Hardware • Tie-Rods

BETHLEHEM STEEL

SPARLING MAIN-LINE METERS

Consistent Accuracy over 3 to 100% Flows

Accurate records of water flows are a necessity in today's Industry. The Sparling Indicator-Totalizer-Recorder shown here, operate by electric remote control from a Sparling Compound Meter, is accurate within 2 per cent on flows from 3% to 100% of the capacity of the pipe. Head loss is practically negligible.

For range of styles and sizes of water meters, instruments and controls, see Bulletin 310—sent at your request!

P. W. SPARLING *Manufacturers of* WATER MEASURING EQUIPMENT

LOS ANGELES 54...Box 3277 Terminal Annex
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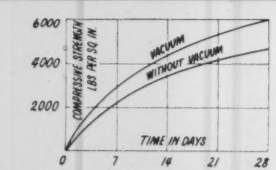
BOSTON 8 .....6 Beacon Street
DALLAS 1.....509 North Ervay Street
622 Broadway.....CINCINNATI 2
101 Parke Avenue.....NEW YORK 17
1932 First Avenue.....SEATTLE 1

VACUUM CONCRETE



S-T-R-E-T-C-H-E-S CEMENT

24 HRS. = DOUBLE STRENGTH
5 YRS. = 1⅓ STRENGTH
OF UNTREATED CONCRETE

Write for Further Information

VACUUM CONCRETE INC. 4210 SANSOM ST. PHILA. 4, PA.

(Continued from page 134)

LATIN AMERICA

Peru, Lima—Republic of Peru, Lima, road constr., day labor. Approx. **$4,158,000.** Ministry of Works, Lima, engrs. CD 1/16/46—ENR 2/7/46.

Venezuela—Ministry Pub. Wks., Caracas, constructing 300 mi. asph. paved roads, 22 bridges and numerous culverts in state of Estado Supre. to Equipos, S. A., Cumana, **$6,000,000.** CD 9/10/47—ENR 10/2/47.

PUBLIC BUILDINGS

BIDS ASKED

April 18

N. Y., New York—Dpt. P. Wks., Municipal Bldg., Zone 7, general contract, plumbing, electrical work for power plant expans. Phase B combined steam tunnel and sea wall Stage 1, on Welfare Island. Plans deposit $25.

Ont., Brockville—G. E. Cook, supt., Brockville General Hospital Bd. Governors, Brockville, 4 story, 44x177 ft., concrete, steel, brick, stone hospital wing. Approx. $460,000. Drever & Smith, 81 Brock St., Kingston, archts. CD 2/18—ENR 3/17.

April 19

Ky., Greyson—Greyson Co., Court House, Leitchfield, hospital. $250,000. Plans deposit $50. Otis & Grimes, Tyler Bldg., Louisville, archts.

April 20

Colo., Denver—School Dist. 1, W. W. Grant, pres. Bd., 414 14 St. 2 story, Smily Jr. High School addn. Raymond R. Erwin, 610 Patterson Bldg., engr. and archt.

N. Y., St. Johnsville—Bd. Educ., Central School Dist. 1, St. Johnsville, school. $400,000. Plans deposit $30. Myron A. Jordan, W. Main St., Richfield Springs, archt. CD 12/13/46—ENR 12/26/46.

April 21

Ala., Auburn—Alabama Polytechnic Institute, Auburn, small animal bldg. Plans deposit $30. Stevens & Wilkinson, 57 Luckie St. N. W., Atlanta, Ga., archts. CD 2/27/45—ENR 3/8/45.

Mo., Rolla—University of Missouri School of Mines & Metallurgy, c/o Curators of University of Missouri, Leslie Cowan, vice-pres., Jesse Hall, Columbia, brick concrete engineering laboratories bldg., at School of Mines and Metallurgy. Plans deposit $25. Jamieson & Spearl, 1636 Arcade Bldg., 812 Olive St., St. Louis, Zone 1, archts. CD 11/20/47—ENR 11/27/47.

Tenn., Fayetteville—Lincoln Co., Fayetteville, hospital addn. Plans deposit $150. Extended date. Hart & McBryde, 407 Cotton States Bldg., Nashville, archts. CD 3/31.

April 22

Colo., Adams City—Consolidated Adams City, Derby, Irondale & Riverdale School Dist., W. R. Fitzsimmons, 1 story, school. Approx. $300,000. T. H. Buell & Co., 730 14 St., Denver, engrs. and archts. CD 12/15—ENR 1/20.

Colo., Derby—Consolidated Adams City, Derby Irondale & Riverdale School Dist. Derby, 1 story school. Approx. $300,000. T. H. Buell & Co., 730 14 St., Denver, engrs. and archts. CD 12/15—ENR 1/20.

Fla., Gainesville—State Bd. Control, Tallahassee. Unit C dormitory, University of Florida, Guy C. Fulton, Peabody Hall, state archt. CD 1/6—ENR 1/20.

Miss., Leakesville—Greene Co., Leakesville, hospital. Plans deposit $25. Landry, Masters, Gischner & Assoc., 218 W. Pine St., Hattiesburg, archts.

Neb., Fremont—City, Will R. Rowe, chn. Dpt. Utilities, Fremont. (1) sectionally supported boiler setting for 75,000 lb. per hr. boiler erected complete (2) one 20 ton per hr. automatic skip hoist type coal handling sys., incl. 150 ton coal storage bunker complete. Lutz & May 819 Finance Bldg., 1009 Baltimore Ave., Kansas City 6, Mo., engrs. CD 2/16/48—ENR 2/26/48.

Ohio—U. S. Engr., 925 New Federal Bldg., Pittsburgh 19, Pa., damtenders dwellings, appurtenances, Berlin Dam, Portage Co., Serial No. Engr-36-058-49-106; damtenders dwellings, storage bldg., appurtenances, Mosquito Creek Dam, Trumbull Co., Serial No. Eng-36-058-49-110. Extended date CD 3/14—ENR 3/17, and CD 3/29—ENR 3/31.

Va., Hopewell—At office Supt. Schools, Hopewell High School, Hopewell, school auditorium, shop addn. and 2 gymnasium. Approx. $300,000. Carneal & Johnston, Atlantic Life Bldg., Richmond, archts.

Ont., Goderich—Bd. Educ., S. Blake, secy., 2 story, bsmt., 80x200 ft., brick, steel school. $350,000. Charles Gillin, 284 Dundas St., London, archt.

April 23

Ore., Eugene—School Dist. 4, Eugene, 12 classroom wood frame with brick and wood siding on exterior Junior High School. $540,000. Wolff & Phillips, Pearson 4th Ave. Bldg., Portland, archts. CD 11/26—ENR 12/9.

Ont., Timmins—V. Salome, town clk., laboratory. Plans deposit $20.

April 25

N. Y., Greenport—Greenport Hospital, Pike St., Mattituck, hospital addn., alterations. $500,000. William La Fon, Jr., 242 Herrick Rd., Southampton, archt.

S. C., Aiken—Aiken Co., Aiken, 50 bed hospital addn. Plans deposit $50. Willis Irvin, 722 Greene St., Augusta, Ga., archt.

April 26

Calif., Stockton—State Div. Architecture, P. Wks. Bldg., Sacramento, 1 and 2 story, 47,000 sq. ft. rein.-con. female patients ward, 1 story, bsmnt., 50x135 ft. concrete warehouse, 60x144 ft. metal covered garage, at Stockton State Hospital. Plans deposit $25. Anson Boyd, state archt. CD 3/5/46—ENR 3/14/46.

April 28

●**N. Y., Binghamton**—Binghamton Housing Auth., City Hall, housing. $2,000,000. Extended date. A. T. Lacey & Sons, 52 Exchange St., archts. CD 3/24—ENR 3/31.

●†**Ore., Portland**—Federal Reserve Bank of San Francisco, U. S. Bank Bldg., 4 story, bsmnt., sub-bsmnt., steel office. $2,500,000. Plans deposit $50. Pietro Belluschi, 2040 S. W. Jefferson St., archt. CD 4/15/47—ENR 5/1/47.

●**Tenn., Chattanooga**—Hamilton County Memorial Hospital, c/o Kaiser, Neal & Reid, archts., Keystone Bldg., Pittsburgh, Pa., hospital. Approx. $1,500,000. Wm. A. Martin, James Bldg., assoc. archt. CD 12/31—ENR 1/6.

About May 4 or June 4

●**Colo., Pueblo**—Colorado State Hospital, Dr. F. H. Zimmerman, supt., 4 story, 300 patient hospital rehabilitation center, $1,000,000; 3 story, 80x350 ft., rein.-con., brick, 360 senile patient hospital, $1,250,000. W. Gordon Jamieson & R. Ewing Stiffler, 818 12 St., Denver, Earl C. Morris, Empire Bldg., Denver, and Walter de Morduant, 758 Thatcher Bldg., Pueblo, archts.

May 4

●†**Pa., Wilkes-Barre**—U. S. Eng., P. O. Box 1715, Baltimore 3, Md., Veterans Admin. Hospital standard quarters, Serial No. Eng-18-020-49-61, for Veterans Admin., Vermont Ave. between H and I Sts. N. W., Wash. 25, D. C. CD 3/16—ENR 3/24.

May 6

●**Va., Blacksburg**—Virginia Polytechnic Institute, Blacksburg, 3 agricultural units. Approx. $1,000,000. Carneal & Johnston, Atlantic Life Bldg., Richmond, archts. CD 9/30/46—ENR 10/3/46.

May 17

●**N. Y., Rome**—Bd. Educ., N. George St., Junior High and Elementary School, $3,000,000. Starrett & Van Vleck & Reginal Marsh, 101 Park Ave., New York, Zone 17, archts. CD 1/13—ENR 2/3.

May 17

●†**Wis., Madison**—U. S. Eng., Clock Tower Bldg., Rock Island, Ill., Veterans Admin. Hospital, Serial No. Eng-11-117-49-21, for Veterans Admin., Vermont Ave. between H and I Sts. N. W., Wash. 25, D. C. Holabird & Root & Burgee, 180 N. Wabash St., Chicago, Ill., engrs. and archts. CD 2/25—ENR 3/10.

June 8

●**La., Shreveport**—State, c/o The Associated Hospital Architects, archts., 202 Ward Bldg., 10 story Confederate Memorial Medical Center Bldg. $10,000,000. Plans deposit $100. CD 9/21—ENR 10/14.

LOW BIDDERS

Colo., Colorado Springs — City, Dpt. P. Utilities, Feb. 18, item 1, power piping, from McCarty-Johnson, 944 Osage St., Denver, **$169,211.** CD 2/1—ENR 2/3.

Conn., Danbury—City, Danbury Memorial Assn., G. A. McLachlan, chn., rejected bids Mar. 24, center part (gymnasium and heating plant) 2 story, brick, reen.-con. War Memorial Community Center, **$375,000.** Total $500,000. CD 3/1—ENR 3/3.

Fla., Miami Beach—City, Mar. 30, city auditorium, from Hoodford Builders, Ins., 1101 Lincoln Rd., **$735,800.** CD 3/1—ENR 3/3.

Ga., Gainesville — Hall Co., Gainesville, Apr. 5, hospital, from Ray M. Lee Co., 1604 Edgewood Ave. N.E., Atlanta, **$879,600.** CD 3/2—ENR 3/10.

N. Y., Brooklyn—Supt. School Bldgs., Design & Construction 49 Flatbush Ave. exten., Zone 1, Apr. 4, general construction (east wing) addn. to P. S. 92, Parkside and Rogers Aves., from T. G. K. Constr. Co., Inc., 55 W. 42 St., New York, N. Y., **$931,319.** CD 3/7—ENR 3/10.

N. Y., Dongan Hills—New York City Housing Auth., 63 Park Row, New York, Zone 7, heating and ventilating for Charles W. Berry Houses, from H. Sand & Co., Inc., 291 Broadway, New York, **$442,620.** CD 3/23.

●**N. Y., East Meadow** — Bd. Supervs. Nassau Co., Old County Courthouse, Mineola, Apr. 5, general contract hospital alterations, addns., from James J. Waters Corp., 145 Lexington Ave., New York, Zone 17, **$6,889,000*****heating and ventilating, from Arthur E. Macke Co., Inc., 173 Christopher St., New York, Zone 14, **$837,000*****plumbing, from Thomas E. O'Brien & Jesse E. Kahn, 121 W. 21 St., New York, Zone 11, **$781,420*****electrical work, from Davidson Electric Co., 1265 Atlantic Ave., Brooklyn, Zone 16, **$572,700.** CD 3/17—ENR 3/24.

●**Tex., Galveston**—John Sealy Hospital, Foundation, 2325 Strand St., Apr. 5, one 6 story and three 3 story, masonry, concrete, steel hospital bldgs., from Texas Gulf Constr. Co., 2008 S. Wayside Dr. Houston, **$4,061,287.** Est. $2,500,000. C. H. Page & Son, 305 W. 11 St., Austin, archts., R. E. Rolfe, 2204 Griffin St.

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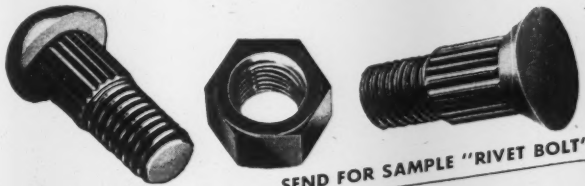

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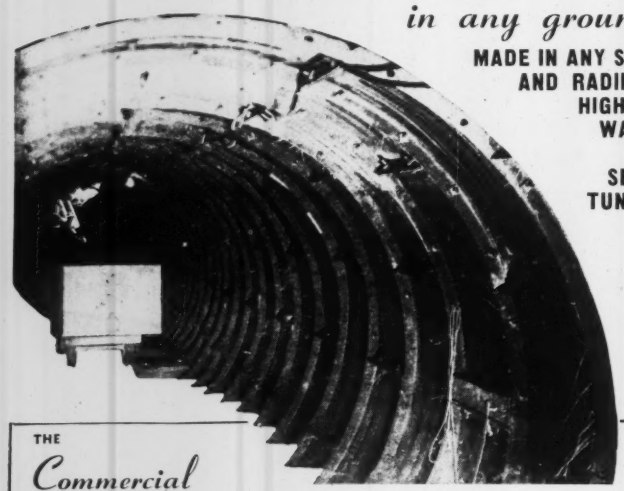

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Dallas, structural engr. Zumwalt & Vinther, 1807 Mercantile Bank Bldg., Dallas, mechanical engrs.

Va., Blacksburg—Virginia Polytechnic Institute, Blacksburg, apparatus and piping for power plant addn., from R. H. Lowe, Inc., 125 Salem Ave. W., Roanoke, **$116,554.** Wiley & Wilson, American Bldg., Richmond, consult. engrs. GD 10/11/44—ENR 10/19/44.

●**Va., Lynchburg**—State Hospital Bd., Richmond, Mar. 31, general contract personnel and patients bldgs. at Lynchburg State Colony, from J. A. Jones Constr. Co., 209 W. 4 St., Charlotte, N. C., **$1,367,000.** CD 3/2—ENR 3/10.

CONTRACTS AWARDED

Ala., Birmingham — City, Ramsey High School gymnasium and auditorium addn., and West End High School gymnasium and auditorium addn., to Daniel Constr. Co., 824 7 Ave. S., **$888,686.** Bids 3/30. CD 4/5—ENR 4/7, under LB.

●**N. Y., New York** — Dpt. P. Wks., Municipal Bldg., Zone 7, general contract Chronic Disease Hospital (city home replacement) Bird S. Coler Memorial Hospital and Home on Welfare Island, to Gerace & Castagna, Inc., 155-10 Jamaica Ave., Jamaica, **$7,663,720*****plumbing, to Jarcho Bros., Inc., 304 E. 45 St., Zone 17, **$1,370,000*****heating, ventilating and refrigeration, to James H. Martin, Inc., 503 W. 43 St., Zone 18, **$941,092.** Grand total $9,977,812. Bids 3/16. CD 3/22—ENR 3/24, under LB.

●**N. Y., Thiells**—Bureau Contracts & Accounts, Albany, 4 infirmary bldgs. at State Hospital for Dpt. Mental Hygiene, to Cauldwell-Wingate Co., 101 Park Ave., New York, Zone 17, **$2,912,000.** Bids 2/16. CD 2/18—ENR 2/24, under LB.

N. C., Lenoir—Caldwell Memorial Hospital, Inc., G. B. Triplett, pres., Lenoir, 100 bed hospital, to McDevitt & Street Co., Builders Bldg., Charlotte, **$618,000.** Bids 3/3. CD 3/8—ENR 3/10, under LB.

●**Pa., Danville**—Dpt. Property & Supplies, 18 and Herr Sts., Harrisburg, general contract, Admission Bldg. 1, at Danville State Hospital, to S. H. Evert Co., Inc., Danville Rd., Bloomsburg, **$1,043,718.** Bids 3/23, awarded 4/4. CD 3/28—ENR 3/31, under LB.

●†**Tenn., Oak Ridge** — U. S. Atomic Energy Comm., P. O. Box 365, Attention Community Constr. Contract Sect., general contract 343 single and duplex family dwelling units, to Maxey & Leftwich, Lubbock, Tex., **$2,833,934;** roadways, sidewalks, sewers, water and gas distr. sys. and landscaping, to Burch Constr. Co., Neff Rd., Dayton, O., **$871,106.** Bids 3/24. CD 3/29—ENR 3/31, under LB.

Tex., Denton—City and Denton, Denton, 38,500 sq. ft. 60-bed masonry Flow Memorial Hospital, concrete pier and beam fdn., to Carpenter Bros., 1335 Plowman St., Dallas, **$599,750.** Bids 3/10, awarded 4/1. CD 3/16—ENR 3/24, under LB.

COMMERCIAL BUILDINGS

BIDS ASKED

April 19

Pa., Phila.—Phila. Bd. City Trusts, 120 S. 3 St., department store alterations, addns. Approx. $250,000. The Ballinger Co., 121 N. Broad St., archt. Lane Bryant, Inc., 12 and Chestnut Sts., lessee. CD 7/23—ENR 7/29.

April 21

S. C., Greenwood—Young Men's Christian Assn., C. Y. Thomason, bldg. chn. City Hall, Y.M.C.A. bldg. Plans deposit $50. James C. Hemphill, Greenwood, archt. CD 3/2/48—ENR 3/11/48.

Tex., Dallas—Kessler Park Methodist Church, 954 N. Wandemere St., masonry chapel and educational church. Approx. $350,000. Plans deposit $15. Bennett & Crittenden, 2812 Fairmont St., archts. CD 5/24/45—ENR 6/14/45.

April 22

Neb., Grand Island—The Sister of St. Francis Hospital, Grand Island, nurses home, $500,000. John K. Monroe, 400 Security Life Bldg., Denver, Colo., engr. and archt. CD 3/18/48—ENR 3/25/48.

April 27

La., Shreveport — Pines Hospital, c/o McClenaghan & Barr, archts., P. O. Box 4117, hospital addn. $300,000. Plans deposit $25.

●**N. Y., Syracuse**—Business Mgr., Syracuse University, Administration Bldg., gymnasium, $2,000,000. Extended date. Lorimer, Rich & Robbins Conn, 215 Montague St., Brooklyn, archts. CD 3/30—ENR 3/7.

Bids Asked

Ill., Chicago—5485 Everett Corp., c/o D. H. Caplan, 109 N. LaSalle St., 12 story, brick, rein.-con. apartment, $600,000. C. W. Nicol & Assoc., 23 E. Jackson St., archts.

SOON LETS CONTRACT

Calif., Los Angeles—Alex Schreiber & Assoc., Dime Bldg., Detroit, Mich., soon lets contract theatre and bowling alleys in Westchester Dist. $400,000. Extended date. Arthur Froehich, 383 S. Robertson St., Beverly Hills, archt. CD 3/2—ENR 3/10.

●**Calif., Los Angeles**—University of Southern California, 3551 University Ave., soon lets contract 4 story, rein.-con. College of Letters, Arts and Science Bldg., $1,000,000. Marsh, Smith

& Powell, 208 W. 8 St., archts. CD 1/14—ENR 2/3.

●**Colo., Lakewood**—E. K. Price & Assoc., 410 Security Bldg., Denver, soon lets contract 45,000 sq. ft. shopping center and theatre, $1,500,000. Roland H. Holbrook, 7340 W. Colfax Ave., Shannahan Bldg., Denver, engr. and archt. CD 9/21—ENR 10/7.

Conn., Storrs—Hillel Foundation, c/o Ebbets Frid & Prentice, archts., 862 Asylum Ave., Hartford, soon lets contract 1 story, bsmnt. synagogue. University of Connecticut. CD 3/28—ENR 3/31.

Fla., Miami—West Flagler Baptist Church, c/o Lester Avery, archt., 123 N. W. 12 Ave., soon lets contract church.

Fla., Tallahassee—First Baptist Church, c/o Prentiss Huddleston & Assoc., archts, 2121 N. Adams St., soon lets contract educational bldg., approx. $250,000. CD 3/8—ENR 3/10, under LB.

●**Ia., Davenport** — St. Lukes Hospital, Bd. Trustees, 1224 E. High St., soon lets contract hospital addn. $1,000,000. S. G. Erickson, c/o Schmidt, Garden & Erickson, 104 S. Michigan Ave., Chicago, Ill., archt. CD 12/14—ENR 12/16.

●**Ia., Waterloo**—Scholtz Memorial Hospital Bd. Trustees, Presbyterian Hosp. Assn., Waterloo, soon lets contract hospital. **$1,500,000.** Skidmore, Owings & Merrill, 100 W. Monroe St., Chicago, Ill., archts. CD 10/9/46—ENR 10/24/46.

Pa., Pleasant Hills—Pleasant Hills Community Church, Crestview Dr., Pittsburgh, Zone 27, soon lets contract church, Old Clairton Rd. $250,000. Hoffman & Crumpton, 1307 7 St., Pittsburgh, archts. CD 2/2/48—ENR 3/4/48.

Ont., London—M. M. Kalman, archt., 1200 St. Alexander St., Montreal, Que., soon lets contract 2 story, bsmnt., 113x175 ft. I-shaped rein.-con., steel, concrete bldg., Dundas and Colborne Sts., for Westmont Realties Co., 1367 Greene Ave., Montreal, Que. Approx. $450,000. L. S. Hackler, 1250 McGill College Ave., Montreal, Que., engr. CD 1/26—ENR 3/24.

LOW BIDDERS

Ala., Mobile—Brothers of Sacred Heart, c/o low bidder, Mar. 29, church, from Butler & Cobbs, Bell Bldg., Montgomery, **$321,640.** CD 3/5—ENR 3/10.

Ga., Atlanta — St. Joseph Infirmary, c/o Abreu & Robeson, archts., 22 Marietta St. Bldg., cancelled bids to have been opened Mar. 31 hospital addn. Project postponed. CD 3/17—ENR 3/24.

●**Md., Baltimore**—Beth El congregation, 1607 Mureay Bldg., rejected Bids Mar. 4, temple community center. **$1,250,000.** CD 2/17—ENR 2/24.

Mass., Clinton—Clinton Hospital Assn., Clinton, Walter P. Bowers Memorial Hospital, from Granger Contg. Co. Inc., 306 Main St., Worcester. **$529,900.** Coolidge-Shapeley-Bulfinch & Abbott, 1 Court St., Boston, archts. CD 9/13/45—ENR 9/27/45.

CONTRACTS AWARDED

●**Calif., Inglewood**—Liberty Bldg. Co., 5548 Arbor Vitae, Los Angeles, 104 frame, stucco dwellings, Tract 14159, owner builds **$1,300,000.** Harry McDonald, 2011 W. 48 St., Los Angeles, archt.

●**Calif., Los Angeles**—Encino Park, Inc., 1308 Shatto St., 509 five room, frame, stucco dwellings in Encino Dist. Owner builds. **$3,260,800.**

Calif., Los Angeles—Valleyheart Co., Inc., 1308 Shatto St., eighty 6 room, frame, stucco dwellings, in Van Nuys Dist. Owner builds. **$808,700.**

●**Calif., Redwood City**—M. J. King, Inc., 231 Franklin St., San Francisco, 500 frame residences, 2 and 3 bedroom, on 192 acre site, Woodside Rd. near Alameda de las Pulgas. Owner builds. **$6,000,000.** J. Lloyd Conrich, 593 Market St., San Francisco, archt. CD 5/7—ENR 5/27.

Fla., St. Petersburg—American Legion Hospital for Crippled Children, c/o contractor, hospital, to Mills & Jones, 2260 4 Ave. S., **$731,481.** Bids 1/7. CD 1/17—ENR 1/29.

●**Ga., Columbus**—The Camellia Apartments, Inc., c/o contractor, 400 apartment units, Fort Benning Rd., to William Constr. Co., 1032 13 St. Approx. **$1,000,000.**

Ill., Chicago—Owner, c/o R. C. Harriss, archt., 53 W. Jackson St., 15 story, brick, granite, stone apartment, to Kollie Foracher Co., 228 N. LaSalle St. Approx. **$875,000.** CD 1/26—ENR 1/27.

Ind., Kokomo—Hubert Layne, Kokomo, 100 homes, Lafayette Pl., west side of city. Owner builds. **$600,000.**

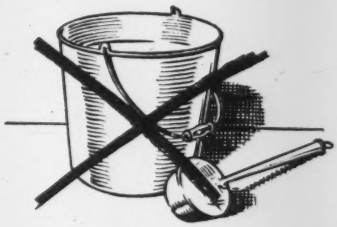
●**La., New Orleans**—Terry Ray Homes, Inc., c/o contractor, residential development, to Shelby Constr. Co., 4329 Paris Ave. Approx. **$1,000,000.**

Md., Dundalk—Young Mens Christian Assn., 24 W. Franklin St., Baltimore, 3 story, brick, limestone Y. M. C. A. bldg., to Redding & Co., Inc., 26 E. 25 St., Baltimore. **$545,000.** Awarded 4/5. CD 3/16—ENR 3/24.

●**Minn., Minneapolis**—C. E. Betcher, Oak Grove Hotel, 20 houses, 4 to 12 units, Wentworth Ave. between 36 and 62 Sts. Owner builds. Approx. **$1,250,000.** I. E. Engler, 1406 West Lake St., archt.

Minn., Minneapolis—House of Vision, 90 S. 9 St., bldg. alteration and third floor addn. Owner builds. Approx. **$500,000.** Liebenberg & Kaplan, 51 S. 13 St. archts.

Neb., Omaha—Carl C. Wilson, Inc., City Natl. Bank Bldg., 102 housing units, Spencer



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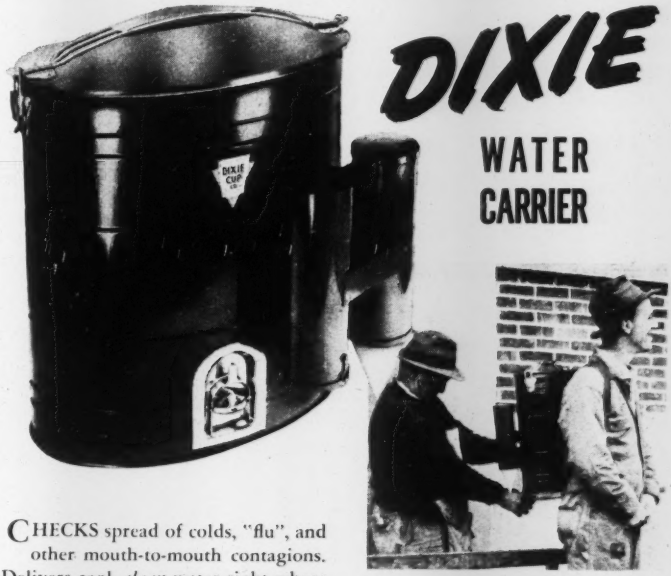

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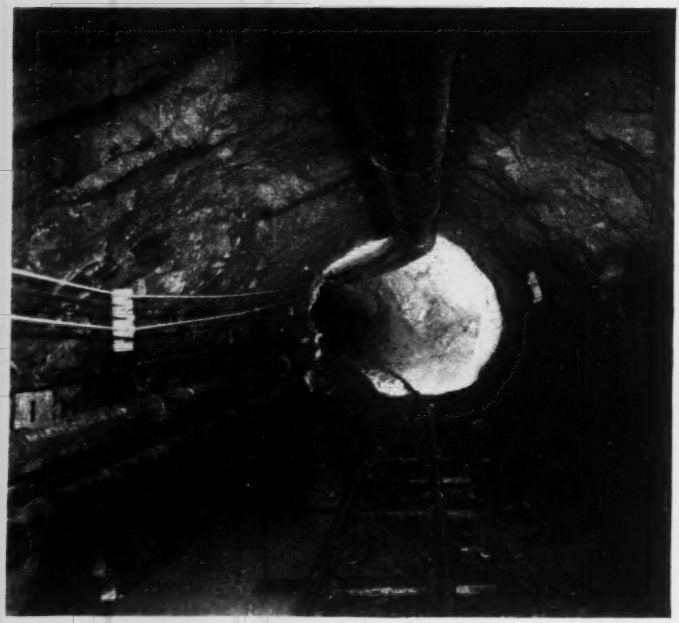

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St. and Florence Blvd. day labor. **Approx. $830,000.** Leo Dworak, 651 J. E. George Blvd., archt.

N. J., Paulsboro—Socony Vacuum Oil Co., Paulsboro, engineering administration office, to Mahoney Troast Constr. Co., 1500 Walnut St., Phila., Pa., **$510,000.** CD 3/14—ENR 3/31.

●**N. Y., New York**—New York Life Insurance Co., 51 Madison Ave., 19 story, penthouse, Manhattan House apartment group, 582 units, and garage, 2 and 3 Aves., 65 and 66 Sts., to Cauldwell-Wingate Co., 101 Park Ave., Zone 17, Approx. **$11,000,000-$14,000,000.** CD 8/29/47—ENR 9/18/47.

●**Ore., Portland**—Carl M. Frantz & John F. Haviland, 1123 S.W. 5 St., 12 story, 212 unit rein.-con. apartment, to Reimers & Jolivette, Builders-Exchange Bldg., **$2,000,000.** Awarded 4/2. Don Byers, Builders Exchange Bldg., archt.

●**Pa., Holtwood**—Pennsylvania Power & Water Co., 62 N. Duke St., Lancaster, 250 brick, concrete block and frame residential units, separate contracts. **$1,500,000.** Henry Y. Shaub, Lancaster, archt.

Pa., Lancaster—Lawnton Homes, Inc., 85 Spencer Ave., 50 two story brick residential housing units, separate contracts. Approx. **$500,000.** Henry Y. Shaub, Lancaster, archt. Henry E. Huth, 53 N. Duke St., engr.

●**Pa., Lancaster**—McCrory Stores, 1107 Broadway, New York, N. Y., department store, N. Queen and E. Kings Sts., to Robbins Constr. Co., 10 S. 18 St., Phila., **$1,000,000.** William M. Simpson, c/o owner, archt.

●**Pa., Lancaster**—Wheatland Hills Development Co., Lancaster, 600 brick, stone residential units, separate contracts. **$8,500,000.** Owen B. Caldwell, 744 Columbia Ave., archt.

Pa., Littlestown—I. H. Crouse & Sons, Littlestown, 70 brick residential housing units, separate contracts. Approx. **$700,000.** T. A. Monk, Jr., 30 S. Queens St., York, engr. and archt.

●**Pa., Malvern**—Tredyffrin County Club Estates, Paoli, residential development, Tredyffrin and Easttown Twp., to Culhane Constr. Co., Edgemoor, Del., **$2,500,000.** Carroll & Stephenson, 262 S. 15 St., Phila., archts.

●**Pa., Phila.**—Fern Constr. Co., Church Lane and Chester Ave., Yeadon, 296 residences, Revere St., etc., separate contracts. **$2,200,000.** Richard R. Neely, 10 S. 18 St., archt.

●**Pa., Pottstown** — Pottstown Co-operative Housing Projects, c/o contractor, residential development, 3 different locations, to Gordon R. Exley, 2nd, Security Trust Bldg., **$1,500,000.**

Pa., Springfield—M. Bernard Cooper, 4246 W. Thompson St., Phila., residential development, Thomson Rd. and Baltimore Pike, separate contracts. **$797,500.**

Pa., Sunbury—Sunbury Community Hospital, L. G. Parrish, supt., Sunbury, general-contract hospital, to Ritter Bros., 1511 N. Cameron St., Harrisburg. **$922,268.** Bids 2/24. CD 3/1—ENR 3/10, under LB.

●**Tex., Dallas**—Clearview Park Inc., c/o D. Elliott & Hub Hill, 2600 S. Hampton St., 300 dwellings, Mountain Lake Rd. and S. Hampton St., own forces. Approx. **$1,600,000;** rein.-con. slab fdns. for 300 dwellings, to R. J. Murphy, 1655 McAdams St., **$65,000.** CD 3/16—ENR 3/31.

●**Tex., Houston**—Frank Sharp, 2202 Rosslyn Rd., 76 residences, on 5 acre tract, incl. paved streets, sewers, water lines, lighting. Owner builds. **$1,000,000.**

Va., Abingdon—Johnson Memorial Hospital, c/o contractor, hospital, to Goode Constr. Co., Johnson Bldg., Charlotte, N. C., **$594,000.** Bids 3/18. CD 3/31—ENR 4/7, under LB.

Alaska, Juneau—Community Building Corp., Juneau, 3 story, bsmt., concrete office, to R. J. Sommers Constr. Co., Juneau, **$296,946.** CD 4/1.

Que., Montreal—Hotel Dieu Hospital, 100 Pine Ave., nurses home, to J. L. Guay Bros. Ltd., 437 Guy St., Appr x. **$700,000.** CD 8/25/47—ENR 8/28/47.

INDUSTRIAL BUILDINGS

BIDS ASKED

April 20

Minn., Milaca — POWER GENERATING PLANT — Rural Cooperative Power Assn., O. N. Gravgaard, pres., Milaca, 2 diesel engines, auxiliary equip., Minnesota-To-Hennepin, $400,000. Plans deposit $25. R. D. Thomas & Assoc., 400 Metropolitan Life Bldg., Minneapolis, engrs. CD 2/3—ENR 2/17.

Bids Asked

Pa., Lansdale — PRINTING PLANT — Sellers & Lauchman, Main and Wood Sts., (selected list bidders) printing plant addn. $70,000.

Pa., Phila. — BAKERY — General Baking Co., 420 Lexington Ave., New York, N. Y., bakery alterations, addns. Approx. $68,000.

Tex., Irving — GAS TERMINAL — Humble Oil & Refining Co., 3010 McKinney St., Houston, 1 story, irregular shape, structural steel frame, gas terminal addn., etc. $200,000. Le Roy F. Skubic, 53 W. Jackson Blvd., Chicago, Ill., archt. CD 3/16—ENR 3/24.

Ont., Petrolia—PLANT—F. Howlett & Sons, R. Howlett, mgr., Petrolia, brick, tile plant, $100,000.

Ont., Wingham — PLANT — Wingham Mfg. Co., Wingham, 3 story, brick factory, $125,000.

SOON LETS CONTRACT

Kan., Great Bend—GENERATING PLANT—Central Kansas Electric Co-operative, Great Bend, soon lets contract generating plant, extens., administration bldg., Contr. 3, power piping, Contr. 5, A. C. Kirkwood & Assoc., 3102 Troost Ave., Kansas City, Mo., engrs.

Minn., Duluth — WAREHOUSE, etc. — W. H. Zeigler Co., J. G. Lewis, vice pres., 304 Lake Ave. S., soon lets contract one 1 story, 161x181 ft. and one 1 story 43x62 ft., concrete office, repair warehouse, machine shop, $150,000. Hansen & Dobberman, 205 Telegram Bldg., Superior, Wis., archts.

Minn., Rochester — PLANT — Marigold Dairies, R. Graupmann, mgr., Rochester, soon lets contract 2 story, bsmnt, 79x114 ft. plant, $125,000. M. & G. Buetow, 1931 University Ave., St. Paul, archt. CD 3/29—ENR 4/7.

N. Y., New York—GENERATING STATION—Consolidated Edison Co. of New York, 4 Irving Pl., soon lets contract electric generating station alterations at E. 138 St. and Locust Ave. $700,000.

R. I., Pawtucket—AUTO STATION—John F. Hogan, archt., 385 Westminster St., Providence, soon lets contract 1 story, bsmnt., 130x180 ft. brick, cinder block, service and sales auto station, Pawtucket Ave., for B. A. Dario Co., 531 Main St. $125,000.

N. D., Grand Forks—SUBSTATIONS—Minnkota Power Co-operative, Grand Forks, soon lets contract 17 69/12.5 kv. stepdown substations and fifteen 69 Kv. threeway switching structures. CD 2/19/47—ENR 3/6/47.

Tex., Dallas—HATCHERY PLANT—Western Hatcheries, Inc., 903 Elm St., soon lets contract 120x203 ft. masonry, structural steel hatchery plant, concrete slab fdn., heating and cooling sys. $100,000. Smith & Warder, Grand Prairie, engrs. and archts.

Tex., Paris — HEADQUARTERS, etc. — Lamoa County Electric Co-operative Assn., Paris, soon lets contract brick, hollow tile headquarters demonstration, garage and storage, concrete frame and slab fdn. $100,000. Wyatt C. Hedrick, 904 Fort Worth Ave., Dallas, archt. CD 8/12—ENR 8/26.

LOW BIDDERS

Calif., San Francisco—WAREHOUSE, etc.—Pacific Container Co., 1455 Vermont St., Mar. 31, 1 story, 124x180 ft., concrete walls and floor warehouse and office, from Tri-City Builders, Majestic Bldg., San Carlos. **$74,308.** CD 3/23—ENR 3/31.

S. C., Greenville—PLANT—Southern Weaving Co., Greenville, exten. present weave room, from Triangle Constr. Co., Greenville. **$94,294.** The McPherson Co., Greenville, engr.

S. C., Laurens—BOTTLING PLANT—Laurens Coca Cola Bottling Plant, Laurens, Mar. 30, bottling plant, from Craig-Roberson Constr. Co., 1610 Westminster Dr., Columbia. **$87,774.** CD 3/23—ENR 3/31.

CONTRACTS AWARDED

Calif., Pacific Grove — LAUNDRY — Del Monte Properties, Del Monte, 1 story, 24,000 sq. ft., concrete, wood laundry, to Robert D. Bardell, 2733 Linden St., Oakland. Approx. **$500,000.** Gardiner A. Dailey, 210 Post St., San Francisco, and Skidmore, Owings & Merrill, 1 Montgomery St., San Francisco, archts.

●**Mass., New Bedford**—POWER PLANT—New Bedford Gas & Edison Light Co., 693 Purchase St., Fall River, 4 and 5 story, 55x102 and 40x125 ft., brick, steel, concrete power plant, Cannon St. Station exten., to Theodore Loranger & Sons, 404 Nash Rd., New Bedford. Approx. **$2,500,000** Gilbert Assoc., Inc., 412 Washington St., Reading, Pa., engr.

Okla., Witcher—PLANT—Peppers Refining Co., First Natl. Bldg., Oklahoma City, Zone 2, construct 18 m. per day cu. ft. capacity natural gasoline plant in the Witcher Oil field, own forces. Approx. **$600,000.**

●**Pa., Phila.** — BREWHOUSE — C. Schmidt & Son, Inc., 2 St. and Girard Ave., design and construction 8 story, 40x75 ft., structural steel brewhouse addn., to Kullian Corp., 1518 Walnut St. **$1,000,000.**

Tex., Dallas—PLANT—Neuhoff Bros., 2821 Alamo St., doubling capacity meat packing plant, to Cedric Burgher Constr. Co., 3027 Main St. Approx. **$750,000.** CD 4/1.

Wis., West Allis—STORES—Wisconsin Electric Power Co., 231 W. Michigan St., Milwaukee, Zone 2, general contract 1 story, 160x208x160x170x245x80 ft., steel, brick cut stone electric distr. stores bldg., concrete fdn., to Thomas H. Bentley & Sons, Inc., 4610 W. Mitchell St., Zone 14. Approx. **$750,000.** Fred A. Luber, Jr., c/o owner, archt.

●**B. C., Ketchikan**—MILL—American Viscose Co., Wards Cove, wood pulp mill, to Morrison Knudsen Co., Inc., 319 Broadway, Boise, Idaho, U. S. A. **$30,000,000.**

UNCLASSIFIED

BIDS ASKED

After April 15

†**Montana**—OUTDOOR SUBSTATION, etc.—U. S. Eng., Fort Peck, 50,000 kva 1.8/115-kv outdoor substation and switchyard, incl. grading, structural excav., backfilling, rein.-con. fdns., sidewalks, underground conduits, pipelines, overhead steel structures, high and low voltage insulators, cables etc., Serial No. Eng., 24-016-49-70. Plans deposit $25.

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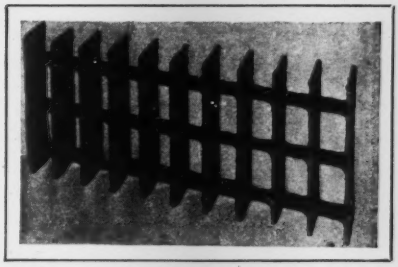

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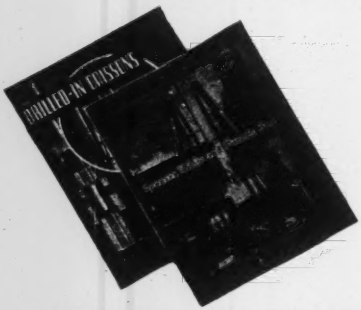

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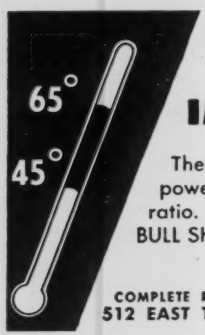

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April 18

●**Pa., Phila.**—PIER—Dpt. Wharves, Docks & Ferries, Pier 4 South Chestnut St., superstructure Pier 80 completion. Approx. $1,000,000. CD 12/28/45—ENR 1/17/46.

April 20

Arkansas and Missouri — RURAL DISTRIBUTION LINES—Carrol Electric Co-operative, Berryville, 236.5 rural distr. lines, conversion of 60 mi., Stone and Barry Counties, Mo., and Benton, Madison, Van Buren, Carroll, Newton, Searcy and Pope Counties, Ark. $250,000. Frank Horton & Co., Lamar, Mo., engrs.

†**Fla., Port Everglades**—PILE DOLPHINS, etc.—J. C. Tily, Officer in Charge of Constr., P. O. Box 365, Dist. Navy Base, Charleston S. C., removing pile dolphins, incl. both steel pipe piles and timber piles, NOY 17176. Spec. 21048.

†**Fla., Riviera Beach**—ADDITIONAL FACILITIES—J. C. Tily, Officer in charge of Construction, P. O. Box 365, Dist. Navy Base, Charleston, S. C., addnl. facilities at Naval Reserve Training Center, NOY 17538. Spec. 21393. Plans deposit $10.

La., Plaucheville—NATURAL GAS SYSTEM—Town, Town Hall, natural gas sys. $97,500. Plans deposit $5. Porter, Barry & Switzer, 211 Main St., Baton Rouge, engrs.

April 22

New York—CANTACT RAIL—Bd. Transportation, 250 Hudson St., New York, Zone 13, installing 150 lb. contact rail for RMT operation to Astoria, Queens Boro, Contr. T-91.

†**Oregon** — TRANSMISSION LINE, etc.—Bonneville Power Admin., 729 N. E. Oregon St., Portland, Zone 8, clearing right of way for and constructing Lyons-Lebanon 230 kv transmission line, Linn Co., Inv. 4555. Plans deposit $25.

April 25

Mo., Ferguson (St. Louis, Zone 21, P. O.)—SWIMMING POOL, etc.—City, Harry O. Vosburgh, mayor City Hall, 14 Church Rd., concrete swimming pool, concrete bath house, January Wabash Park. Approx. $100,000. Plans deposit $25. Extended date. Wischemeyer & Lorenz, Bd. Educ. Bldg., 911 Locust St., St. Louis, Zone 1, archts. Paul Klengensmith & Assoc., 4232 W. Pine St., St. Louis, Zone 8, consult. archts. Harland Bartholomew & Assoc., Louderman Bldg., 317 N. 11 St., St. Louis, Zone 1, consult engrs. CD 4/5.

April 26

South Dakota — RURAL DISTRIBUTION LINES—Lake Region Electric Assn., H. L. Wilson, mgr., Webster, approx. 311 mi. rural distr. lines, Day Co. $250,000. Plans deposit $25. Banister Eng. Co., 1549 University Ave., St. Paul, engrs. CD 7/16—ENR 7/29.

Bids Asked

Tex., Dallas — TELEVISION STATION — Lacy-Potter Television, 1519½ Commerce St., 377 ft. steel television tower, 8'x8' ft. studio, etc., (call letters KBTV). $200,000. Phoshea & Cheek, 1901½ N. Harwood St., archts.

SOON LETS CONTRACT

Ia., Sioux City—BASEBALL FIELD—Owner, c/o Wm. Buettner, archt., Insurance Exchange Bldg., soon lets contract baseball memorial field, $125,000. CD 4/7—ENR 4/29.

Louisiana—RURAL DISTRIBUTION LINES—Louisiana Rural Electric Co-operative, P. E. Roudal, mgr., Alexandria, soon lets contract 247 mi. rural distr. lines, Grant, Natchitoches, Evangeline, Avoyelles and St. Landry Parishes. $252,000. Plans deposit $15. Extended date. Freeze & Nichols, 407 Daniger Bldg., Fort Worth, Tex., engrs. CD 2/11—ENR 2/17.

Mississippi—RURAL DISTRIBUTION LINES—Tombigbee Electric Power Assn., Tupelo, soon lets contract 150 mi. rural distr. lines, Lee Co. Bowman & Bowman, Box 518, Greenwood, engrs. CD 6/4—ENR 6/24.

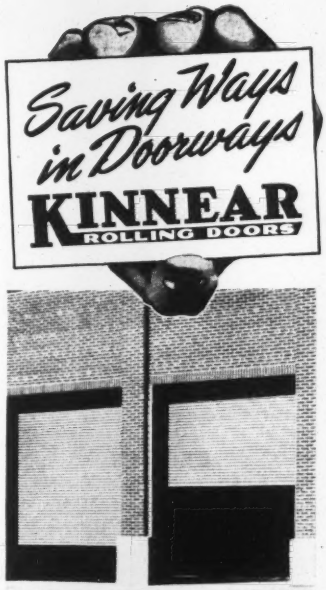
Missouri—RURAL DISTRIBUTION LINES—Crawford Electric Co-operative, Inc., S. H. Hicks, pres., Bourbon, soon lets contract 240.66 mi. rural distr. lines, Crawford, Franklin, Washington, Gasconade and Dent Counties, Missouri. 54H Crawford. Plans deposit $25. Birnbaum & Smith, 5968 Cote Brilliante Ave., St. Louis, Zone 12, engr. CD 3/15—ENR 3/24.

LOW BIDDERS

†**Arizona and Nevada** — TRANSMISSION LINE — Bureau Reclamation, Dpt. Interior, Aviola Bldg., Phoenix, Ariz., Mar. 25, Coolidge-ED No. 5, 115 kv. transmission line, using (1) aluminum conductor; (2) copper conductor; (3) copperweld-copper conductor, from Vyne Brothers Electric Co., Prescott, Ariz., (1) $200,569 (2) $248,200 (3) $350,825. CD 3/15—ENR 3/17.

●†**California**—TUNNEL, etc.—Bureau Reclamation, Dpt. Interior, Bldg. 1-A, Denver Federal Center, Denver, Colo., rejected bids Mar. 10, constr. Tecolote Tunnel and access road, Santa Barbara Proj., about 10 mi. west of Santa Barbara Proj., Spec. 2556, L.B. $5,482,865. CD 3/15—ENR 3/17, under LB.

Calif., San Jose — GRANDSTAND — Santa Clara Fair Assn., c/o Bd. Supervs. Santa Clara Co., Courthouse, Mar. 28, 83x400 ft. rein.-con. steel grandstand, horse barn, locker rooms, at Fairgrounds, from Robert L. Wilson, 158 S. Park St., San Francisco, $412,881. (Correction—name of Low Bidder). ENR 4/7, under LB.



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Ia., Logan—SWIMMING POOL—City, E. J. Wood, clk., City Hall, rejected bids Mar. 24, rein.-con. swimming pool, wading pool, bath house, filter equip. **$60,000.** CD 3/18.

●**Md., Baltimore**—STADIUM—Mayor & City Council, City Hall, rejected bids Mar. 30, first section stands, utilities, administration bldg. alterations, Municipal Memorial Stadium, E. 33 St., L. B. **$1,245,000.** Will re-advertise. CD 4/5, under LB.

Mass., Worcester—PLANTING, etc.—City Housing Auth., 58 Pearl St., Mar. 30, planting, grading and landscape work, Coes Pond Housing, from Littlefield-Wyman, Nurseries, 227 Center Ave., Abington, **$54,497.** Williams & Kunz, 20 Elm St., archts. CD 3/4—ENR 3/17, under Public Bldgs.

Tex., Amarillo—STADIUM—Amarillo Independent School Dist., Amarillo, Mar. 29, **15,000** seating capacity stadium, from Ramey Mathis Co., Box 6, **$223,033.** Est. $250,000. Grayson Gill, 1913 San Jacinto St., Dallas, archt.

†**Tex., Camp Hood**—PARKING HARDSTANDS—U. S. Eng., 606 Santa Fe Bldg., Galveston, Mar. 29, motor parking hardstands, loading platforms, Inv. No. Eng-41-243-49-228, from H. B. Zachry Co., P. O. Box 2570, San Antonio, **$262,192.** Est. $300,000. CD 3/21.

Wis., Milwaukee—BATHHOUSE, etc.—Milwaukee County Park Comn., Courthouse, Mar. 31, bathhouse and pedestrian bridge at Bradford Beach, from S. C. Knuth & Co., 2919 W. Fond du Lac Ave., Zone 10, **$173,490.** CD 3/8—ENR 3/10.

CONTRACTS AWARDED

Kan., Turner—LOADING DOCK—The Atchison, Topeka, and Santa Fe Ry Co., F. D. Kinnie, ch. engr., Topeka, loading dock and office, to Collins Constr. Co., Land Bank Bldg., Kansas City, Mo., **$250,000.**

Mass., Melrose—FIELD HOUSE—City, Park Comn., Mt. Hood St., field house, high school stadium, to Wexler Constr. Co. Inc., 2 Elm Pl., Brookline, **$53,133.** Bids 3/7, awarded 3/28.

●†**Nebraska**—RAILROAD RELOCATION—U. S. Eng., 601 Davidson Bldg., Kansas City 8, Mo., relocating Oxford Branch of the C. B. and Q. R. R. incl. 19.78 mi. track, roadbed, etc. Franklin and Harlan Counties, Proj. Eng-23-028-49-136, to Morrison-Knudsen Co., Inc., 519 Broadway, Boise, Idaho. **$2,966,000.** Bids 3/11. (**Correction**—status). CD 4/4—ENR 4/7, under LB.

Pa., Harrisburg—DRIVE-IN THEATER—Keystone Drive-In Theatres, 2964 Heather Pl., 750 car open air drive-in theatre to Bernard Fliam, 507 Division St., **$100,000.** W. Walter Whitman, c/o owner, archt. John K. Class, 1007 Melrose St., engr.

●**Texas - Louisiana - Mississippi - Tennessee - Kentucky-Ohio**—NATURAL GAS PIPELINE—Texas Gas Transmission Corp., Owensboro, Ky., gas pipeline from Carthage Gas Field, Tex. to Lisbon, La., to N. A. Slaigh Co., American Hospital & Life Bldg., San Antonio, Tex.***from Lisbon, La. to Mississippi River near Greenville, Miss., to Latex Constr. Co., 2707 Perdide St., Houston, Tex. ***Mississippi River Crossing to Lula, Miss., to O. C. Whitaker Co., Wag Bldg., Fort Worth, Tex.***210 mi. spreads between Memphis, Tenn. and Slaughters, Ky., to Horrigan Constr. Co., Commerce Bldg., Houston, Tex.***180 mi. spreads to Ohio River near Louisville, Ky., to Williams Bros. Corp., National Bank Tulsa Bldg., Tulsa, Okla.***Louisville, Ky. to northern terminus of Lebanon, Ill. to connect with Big Inch System, to Midwestern Constr. Co., Tulsa, Okla.***compressor stations along line, to Stone & Webster Engineering Corp., Federal Bldg., Boston, Mass. L. R. Basham, vice-pres. will supervise construction for owner. **$73,500,000.** CD 7/6/48—ENR 7/8/48, under CA.

Texas—GAS LINES—United Gas Pipe Line Co., Alamo Natl. Bldg., San Antonio, 16 and 20 in. gas pipelines from Coy City gas fields to Karnes City, Karnes Co., to Massey Pipe Line Constr., Hy. 9, Corpus Christi. Approx. **$70,000.**

Tex., Corpus Christi—GAS LINES—City, c/o Gas Dpt., Corpus Christi, natural gas lines, own forces. **$100,000.** W. P. LeGrand, city engr. CD 11/19/48—ENR 12/30/48.

Alta., Edmonton—TRANSMISSION LINES—Northland Utilities, Ltd., Edmonton, transmission lines, own forces. **$100,000.**

●**N. S., Halifax**—PIER—National Harbours Bd., West Block, Ottawa, Ont., reconstructing Pier 3, to E. G. M. Cape & Co., 628 Cathcart St., Montreal, Que., Approx. **$2,029,120.** CD 3/15—ENR 3/24.

●**Ontario**—POWER DEVELOPMENT, EXCAVATION—Dir. Supply, c/o Hydro Electric Comn. of Ontario, 620 University Ave., Toronto, diversion channel excav., Lat'ave power development, incl. Part A, 194,000 cu. yd. and Part B 363,000 cu. yd. excav., to C. A. Pitts Ltd., 67 Yonge St., Toronto, **$1,200,000.** Bids 3/8. CD 2/25—ENR 3/3.

Ont., Toronto—SUBWAY—Toronto Transportation Comn., 35 Yonge St., 8,000 tons unfabricated structural steel for Yonge St. Subway, to Bethlehem Steel Export Corp., Royal Bank Bldg. Bids 2/2. DeLeuw Cather & Co., 20 W. Wacker Dr., Chicago, Ill., U. S. A., engr. CD 1/26.

Que., Quebec City—RADIO STATION—J. N. Thivierge, Radio Station, C. J. M. T., radio station, to Albert Baker, c/o Goodwill Broadcasters of Quebec, Inc., 114 St. John St. Approx. **$65,000.**

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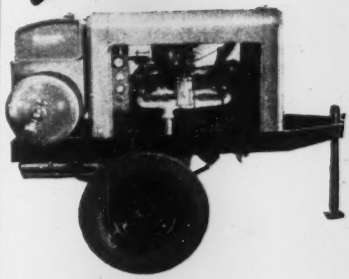

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CONSTRUCTION REPORTS—Third Section

WATER SUPPLY

BIDS ASKED

April 26

Calif., Ione—State Div. Architecture, P. Wks. Bldg., Sacramento, concrete pipelines at Preston School of Industry. Anson Boyd, state archt.

May 2

Colo., Canon City—City, City Hall, water sys. improv., incl. basins at reservoir, pipeline in Royal Gorge, intake basin to replace pipe in north part of city, pumping plant, on Arkansas River, west of Sada Point. $330,000. Plans deposit $25. Blackburn Eng. Co., 111 E. 5 St., Pueblo, engrs. and archts. CD 10/29—ENR 11/11.

May 3

†Tex., Camp Hood (br. Killeen)—U. S. Eng., 606 Santa Fe Bldg., Galveston, cl., waterlines and fire plugs, appurtenances, $50,000; elevated steel water tank and tower, $50,000 near Killeen and Belton.

May 10

Ohio, Brilliant—Bd. Trustees Pub. Affair, Brilliant, Zeolite Water Softening Co., Inc., incl. **(a)** softening equip., **(b)** bldg. to house softening equip., incl. piping, equip., installation; **(c)** lump sum bid for structure equip., complete. $28,000. Plans deposit $5. Burgess & Niple, 568 E. Broad St., Columbus, engrs.

LOW BIDDERS

Ore., Roseburg—Roberts Creek Water Dist., Roseburg, Apr. 4, 300 g.p.m. capacity water filtering plant, furnish low lift and high lift pump, provide intake in south Umpqua River, furnish, lay 18,400 ft. 4-to-10-in. pipe, from P. S. Lord, 4507 S. E. Milwaukee St., Portland, **$116,480.** CD 3/17—ENR 3/24.

CONTRACTS AWARDED

Ariz., Phoenix—City, WW, incl. 6,300 ft. concrete pipeline in water transmission sys. to Vinson Constr. Co., 2020 W. Grant St., **$214,452.** Awarded 4/6.

Ia., Iowa Falls—City, elevated water tank, to Pittsburgh-Des Moines Steel Co., 1015 Tuttle Bldg., Des Moines, **$61,950.** Bids 3/31. CD 3/18—ENR 3/24.

●Md., Baltimore—Mayor & City Council, City Hall, 12,500 lin. ft. 30 and 48 in. watermains, etc. underwater sects. across harbor and Patapsco River, Lazaretto-Fort McHenry-Fairfield watermains, to McLean Contg. Co., 1301 Fidelity Bldg., **$1,866,000.** CD 4/7—ENR 4/7, under LB.

SEWERS, WASTE DISPOSAL

BIDS ASKED

April 19

Ont., Toronto—Municipality, Chn. Bd. Control, sewers in Clifton Rd., Edward St., Jane West of Yonge St., and lane east of Yonge St., Murray Stewart, city engr. CD 8/10/44—ENR 8/24/44.

April 21

†N. M., Albuquerque—U. S. Eng., P. O. Box 1538, main outfall sewers, 4 mi. southeast of here. Serial No. 291-49-93. Extended date. CD 4/5—ENR 4/7.

April 25

Calif., Fresno—City, 2326 Fresno St., Fresno, approx. 5 mi. rein.-con. sanitary sewers. Over $50,000. Plans deposit $25. A. Segel, City Hall, city engr. CD 3/29/47—ENR 4/3/47.

Wis., Monona—Village, **(1)**, excavating, laying, backfill 10,417 ft. 8 and 10 in. sewer pipe, 201 ft. manholes, **(2)**, excavating, laying, backfill 6,000 ft. 6 in. service lateral. Plans deposit $10. General Eng. Co., Portage, engr.

April 26

Ind., Jasper—Bd. P. Wks., Jasper, sewage treatment works. $240,000. Crough & Kuhn, 224 Mausur Bldg., 312 E. Washington St., Indianapolis, consult. engrs. Plans deposit $25.

May 2

Minn., Edina (P. O. Minneapolis)—Village, R. Hawthorne, clk., lateral sewer sects. from St. Louis Park Sewer Districts 21 and 24 into part of Edina north of 44 St. east of State Hy. 100. $160,000. P. W. Smith, village engr.

Minn., Fergus Falls—City, I. Mickelson, clk., 29,753 lin. ft. sanitary sewers, and 69 precast concrete manholes. $50,000. Plans deposit $15.

Minn., St. Louis Park—Village, J. Justad, clk., sanitary sewer for Sanitary Sewer Dists. 21 and 24. $100,000. W. C. Utton, village engr.

May 9

Nev., Reno—City, City Hall, sewage treatment plant, incl. primary treatment plant, Proj. Unit 2, municipal sewage works enlargement, over $50,000. Plans deposit $30. E. C. Frisch, City Hall, city engr. H. N. Jenks, 63 Crescent Dr., Palo Alto, Calif., consult. engr.

May 15

O., Columbus—City, Elmer A. Keller, dir. Pub. Service, sewage treatment, expan. sludge digestion facilities, $800,000. Plans deposit $25. Extended date. Paul A. Uhlmann & Assoc., 1441 N. High St., engrs. CD 3/9—ENR 3/17.

LOW BIDDERS

Calif., Stockton—Pacific Gardens Sanitary Dist., c/o Bd. Supervs., San Joaquin Co., Courthouse, rejected bids Mar. 7, sanitary sewers, sewage pump. plant, L.B. **$117,700.** CD 3/16—ENR 3/24, under LB.

Kan., Baldwin—City, rejected bids Mar. 20, sewage plant, L. B. **$89,200.** Will readvertise. CD 3/8—ENR 3/10.

Wis., Delavan—City, Apr. 1, sewage treatment plant, from Central Contg. Co., 1220 Arizona Blvd., Oshkosh, **$192,780.** CD 3/10—ENR 3/17.

CONTRACTS AWARDED

N. Y., Amherst—Town, Town Hall, Main St., Williamsville, sewage treatment plant, to Rieder Bros. & Bennett, Inc., 506 Morgan Bldg., Buffalo, **$607,900.** CD 3/17—ENR 3/24, under LB.

BRIDGES

BIDS ASKED

STATE HIGHWAY LETTINGS

April 19
Kansas
South Carolina
April 20
Maine
New York
April 22
Kentucky
April 27
Texas
April 28
New Jersey
April 29
Pennsylvania
May 3
Oklahoma

LOW BIDDERS

New Hampshire—State Hy. Dpt., Concord, Apr. 7, 165 ft. span rein.-con. arch bridge and 0.82 mi. surface treated gravel approaches, Rt. 111, Proj. No. S-28 (1), Hollis, from Clayton W. Chase, Milford. **$148,553.** CD 3/25—ENR 3/31.

CONTRACTS AWARDED

Arizona—State Hy. Dpt., Phoenix, bridge over Gila River, Greenlee Co., to Vinson Constr. Co., 2020 W. Grant St., Phoenix, **$249,499.** Bids 3/24, awarded 4/4. CD 3/14.

Arizona—State Hy. Comm., Phoenix, railroad bridge and overpass over Gila River, Greenlee Co., to Vinson Constr. Co., 2020 W. Grant St., Phoenix, **$349,499.** Awarded 4/7.

Arkansas—State Hy. Dpt., Little Rock, 7 bridges, Montrose-Lake Village Rd., Chicot Co., to M. & W. Constr. Co., Tupelo, Miss., **$169,590*****bridge across Fifteen Mile Bayou, Marion, Crittenden Co., to Consolidated Constr. Co., 1189 Thomas St., Memphis, Tenn., **$57,427** ***overpass over Rock Island R. R. tracks, Fordyce, Dallas Co., to Cook Constr. Co., Standard Life Bldg., Jackson, Miss., **$149,742** ***bridge, approaches over Spring River, Walnut Ridge, to E. R. Barber, Ft. Smith, **$209,392.** Bids 4/4. Grand total $586,151. CD 3/30.

●Md., Baltimore—Mayor & City Council, City Hall, Waterview Ave., Underpass and Interchange thru (limited access) Hy., Baltimore-Washington Annapolis Ave. and Waterview Ave., Baltimore F. A. P. RD U 1485 (5), to The Lee Butler Co., Silver Spring, **$1,448,977.** CD 3/22—ENR 3/24, under LB.

●New Jersey—State Hy. Dpt., Trenton, superstructure, Island Heights—Seaside Heights Bridge, Contr. 2, Route 37, Ocean Co., to Ole Hansen & Sons, Inc., Pleasantville, **$1,330,138.** Est. $1,543,720. Bids 4/7. CD 3/11—ENR 3/17.

STREETS AND ROADS

BIDS ASKED

STATE HIGHWAY LETTINGS

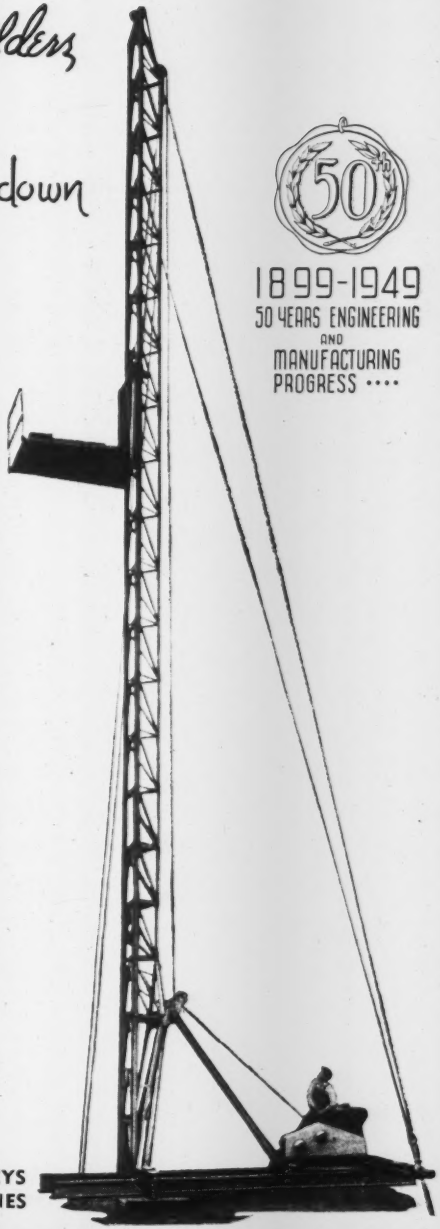
April 19
Kansas
Maryland
New York
South Carolina
April 20
Maine
April 22
Kansas
Kentucky
Missouri
April 25
Kansas
April 26
Texas
Wisconsin
April 27
California
Texas
April 28
New Jersey
April 29
Pennsylvania
May 3
Oklahoma

April 19

Minn., Duluth—City, C. D. Jeronimus, clk., constr., repairing, relaying sidewalks in city for season of 1949, approx. $50,000. A. W. Tews, city engr.

(Continued on page 166)

When Clyde Portable Builders Towers go up ..... Material handling costs go down



50th

1899-1949
50 YEARS ENGINEERING AND MANUFACTURING PROGRESS ....

Clyde Portable Builders Towers are specially engineered for high speed, low cost material handling on building projects. They are easy to transport from job to job . . . load the entire machine on a truck or tow it on trailer wheels. They are simple to erect and just as simple to take down.

Towers are assembled in complete safety on ground and raised to operating position by their own hoist. No erection hazards . . . no special equipment needed. Towers up to and including 100 ft. in height are raised in this manner.

Two sizes available.

MODEL PBT . . . 40 ft. tower with 10 ft. extensions to 70 ft. Load capacity 2000 lbs.

MODEL HPBT . . . 40 ft. tower with 10 ft. extensions to 100 ft. Load capacity 2500 lbs. Platform, both models, 5'6"x6'6".

ACCESSORIES: 2000 lb. capacity derrick that mounts on top of tower . . . ½ yd. concrete bucket to be used in place of elevator platform . . . trailer wheels for towing entire machine by truck or tractor.

●

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(Continued from page 164)

April 28

†**N. Y., Bellmore**—Pub. Wks. Office, New York Naval Shipyard, Brooklyn, Zone 1, paving, roadway, installing one dry well catch basin and 15 lines precast concrete duct across highway at Naval Communications Station, Spec. 21274. Plans deposit $10.

LOW BIDDERS

Arizona—State Hy. Comn., Phoenix, Mar. 4, bit. surf., 4 mi. Phoenix-Yuma Hy., near Wellton, Yuma Co., from Western Construction, Inc., El Paso, Tex., **$496,617.** CD 2/25.

Ariz., Phoenix—City, street imprv., bit. surf., from Benson Contg. Co., 151 W. Watkins Rd., **$93,646.** CD 1/6—ENR 1/20.

California—State Div. Hys., State Bldg., Los Angeles, Mar. 31, plant mix surf., 4 mi. between Long Point and 13 mi. west of Running Springs, San Bernardino Co., from Frederickson & Kasler, 242 13 St., Sacramento, **$779,094.** CD 3/7—ENR 3/16.

California — State Div. Hys., Sacramento, Apr. 6, untreated rock surf. apply Class B, double seal coat 4.1 mi. to central portion and penetration treatment 2.9 mi. between east city limits of Oroville and Feather River Bridge, Butte Co., from Rice Brothers, Box 1489, Marysville, **$58,221*****place untreated rock base over existing pavement and plant mix surf. 5.2 mi. between Bierman Rd. and easterly San Joaquin Co. line, San Joaquin Co., from Granite Constr. Co., Box 900, Watsonville, **$89,435*****plant mix on cement treated imported sub-base material surf. 4.3 mi. San Julian Rd. between Jalama Rd. and Route 149, Santa Barbara Co., from Raud Constr. Co., Inc., Bakersfield, **$305,457*****grading, constr. grade separation structure, 4.4 mi. between Spring Hill and Alwood, Siskiyou Co., from Harms Brothers, 5162 Stockton Blvd., Sacramento, and F. Fredenburg, 1717 Garibaldi Ave., Temple City, **$349,750.** CD 3/14—ENR 3/17.

Calif., Los Gatos—Town, 110 E. Main St., Los Gatos, imprv streets, from Lew Pazza, 175 S. Montgomery St., San Jose, **$111,990.**

CONTRACTS AWARDED

Arizona—State Hy. Dpt., Phoenix, bit. 4.75 Black Canyon Hy., Maricopa Co., to Arizona Sand & Rock, 7 St., Phoenix, **$362,585.** Bids 3/24, awarded 4/7. CD 3/11.

Arizona—State Hy. Comn., Phoenix, grading, draining, base material, bit. 1 mi. Clifton-Morenci Hy., Greenlee Co., to Fisher Contg. Co., 2201 S. 19 Ave., Phoenix, **$222,514;** grading, draining, bit. 4¾ mi. Maricopa Co., to Arizona Sand & Rock Co., 7 St., Phoenix, **$367,585.** Bids 3/29, awarded 4/7. CD 3/18.

Arkansas—State Hy. Dpt., Little Rock, gravel base course, bit. 8.8 mi. Hy. 270, Pine Bluff, Jefferson Co., to Reynolds & Williams, Tyler, Tex., **$301,422*****stav. base, bit. 9¼ mi. Hy. 79, Hughes, Lee and St. Francis Counties, to W. W. Kealoh, 115 N. Spring St., Little Rock, **$333,053*****grav. base, bit. 9.14 mi. State Hy. 88, Fayetteville, Washington Co., to Southeast Constr. Co., 127½ Main St., Pine Bluff, **$169,480.** Bids 1/8. Grand total $803,975. CD 3/30.

New Jersey—State Hy. Dpt., Trenton, 2.041 mi. divided highway paving, Rt. 28, Sect. 28, Hunterdon Co., to A. J. Cunningham & Sons, 570 Newark Ave., Trenton, **$597,243.** Est. $720,000. Bids 4/7. CD 3/24—ENR 3/24.

Tex., Bishop—City, John G. Michalk, mayor, Bishop, asph. paving, grading, relaying waterlines where required, to J. N. Sanford, Kingsville, **$65,000.**

Wash., Seattle—City, County-City Bldg., Zone 4, grading, paving Campus Parkway, 10 to 11 Aves. N. W., to Northwest Constr. Co., 3950 6 Ave. N. W., Seattle, **$99,434,** Est. $103,789. Bids 4/6. CD 3/20.

EARTHWORK, WATERWAYS

CONTRACTS AWARDED

Ariz., Phoenix—Salt River Valley Water Users Assn., 145 W. Van Buren St., floodgates on Horseshoe Dam, to Daley Constr. Co., 2400 S. 16 St., **$165,400.** Awarded 4/4.

●†**Louisiana**—U. S. Eng., foot of Prytania St., New Orleans, Zone 3, 3,840 cu. yd. semi-compacted embankment, to Barranza Contrg. Structure, Point Coupee Parish, Serial No. Eng-16-047-49-239, to Grenada Dam Constructors, Inc., P. O. Box 1105, Grenada, **$1,555,113** Est. $1,250,000. CD 4/5—ENR 4/7, under Lft.

†**Wash., Everett**—U. S. Eng., 4735 E. Marginal Way, Seattle, Zone 4, dredging 110,450 cu. yd. material from shoals areas in harbor, to General Contr. Co., 3849 Iowa St., Seattle, **$32,803.** Est. $33,135. Bids 4/5. CD 3/15—ENR 3/17.

LOW BIDDERS

La., Chalmette—Police Jury St. Bernard Parish, Chalmette, 342,000 cu. yd. channel excav., from C. W. Vollmer & Co., P. O. Box 5220, Franklin **$59,675.**

●†**Montana**—Bureau Reclamation, Dpt. Interior, Old High School Bldg., N. Warren St., Helena, Apr. 6, Canyon Ferry Dam, Power Plant, Canyon Ferry Unit, Missouri River Basin Proj., on Missouri River, 16 mi. northeast of Helena, Spec. 2585, from Canyon Constructors, Los Angeles, Calif., **$11,896,425;** CD 2/23—ENR 3/16.

AIRPORTS AND AIRBASES

BIDS ASKED

April 20

Colo., Grand Junction—AIR TERMINAL—city, City Hall, 1 story, part bsmnt., 30x194 ft., brick air terminal, Walker Field, $70,000. Extended date. Smith Hegner & Moore, 505 First Natl. Bank Bldg., Grand Junction, engrs. and archts. CD 3/14—ENR 3/17.

April 29

†**Conn., Windsor Locks**—WAREHOUSE—U. S. Eng., Bldg. 21, Naval Drydocks, South Boston, Mass., 37x288 ft. warehouse, at Bradley Field. CD 4/4/48—ENR 6/17/48.

May 2

Puerto Rico—AIRPORT—Puerto Rico Transportation Auth., San Juan, Isla Verde Airport clearing, grading, drainage, 898., Projs. No. 9-53-001-701 and No. 9-53-001-902. Plans deposit $100. CD 10/18—ENR 11/4.

May 5

†**Wash., Walla Walla**—APARTMENTS—U. S. Eng., 19 E. Poplar St., converting 6 barracks for officer quarters at Walla Walla Air Base into apartment bldgs., Col. Wm. Whipple, dist. engr.

CONTRACTS AWARDED

†**Alaska, Fairbanks**—AIRPORT—Civil Aeronautics Admin., Box 440, Anchorage, airport, near here, Inv. No. 849-842, to Morrison-Knudsen Co., Inc., 319 Broadway, Boise, Idaho, **$2,845,728.** Bids 3/15. CD 2/10—ENR 2/17.

PUBLIC BUILDINGS

BIDS ASKED

April 20

Kan., Kansas City—Bd. Pub. Utilities, chemical bldg. and basins, $50,000. Burns & McDonnell, 95 and Troosts Sts., Kansas City, Mo., engrs. CD 11/24—ENR 12/9.

April 25

Conn., Weston—Town School Bldg., Comn., Westport, 1 story, bsmnt., school and bus garage, Weston Rd., $450,000. E. F. O'Dwyer, Westport, archt. CD 1/17—ENR 1/27.

After April 25

N. C., Pinehurst—Moore County Hospital, Pinehurst, hospital alterations, addns. W. W. Hook & Assoc., 305 4 St., Charlotte, archts.

April 26

Conn., Simsbury—Town, Paul D. Collier, chm. Bldg. Comn., Central School addn., incl. 6 classrooms, kindergarten, gym. and auditorium and health depts. library, etc. Approx. $250,000. Carl J. Malmfeldt & Assoc., 36 Pearl St., Hartford, archts. CD 12/9—ENR 12/23.

April 28

Wis., Port Washington—Bd. Educ., Port Washington, 2 story, bsmnt. school. Plans deposit $50. Foeller, Schobert, Bernets, Safford & Jahn, 310 Pine St., Green Bay, archts. CD 12/17—ENR 1/7.

May 3

Neb., Blair—City, power plant imprvs., incl. power piping, power wiring, bldg. constr., $70,000. Black & Veatch, 4706 Broadway, Kansas City, Mo., engrs. CD 3/4.

May 5

†**Neb., Alliance**—Nebraska Natl. Guard, State Bldg., Lincoln, motor vehicle storage bldg., $85,000.

Wash., Seattle—School Bd., 810 Dexter Ave., Fauntleroy School addn., $350,000. G. W. Stoddard & Assocs., 1213 Westlake Ave. N., archts.

May 9

†**Neb., Kearney**—Nebraska Natl. Guard, State Bldg., Lincoln, motor vehicle storage bldg., $85,000.

May 19

Ia., Forrest City—City, Forrest City municipal light & power plant extens., Sect. 1, diesel generating units and auxiliaries, Sect. 2, bldg. constr. and imprvs. plant bldg. Sect. 3, electrical work incl. switchboard, bus structure, new feeding cable and wiring. Over $70,000. Stanley Eng. Co., Hershey Bldg., Muscatine, engr.

May 20

†**Ark., Little Rock**—U. S. Eng., 300 Broadway, Little Rock, managers residence, two duplex dwellings, nurses' home and attendants' quarters for Veterans Hospital, Inv. No. Eng-03-050-49-62.

LOW BIDDERS

Ark., Fayetteville—University of Arkansas, Fayetteville, Mar. 29, fine arts bldg., from Harmon Constr. Co., Wallace Bldg., Little Rock, **$656,000.** CD 3/2—ENR 3/10.

Ark., Fayetteville—Washington Co., Fayetteville, hospital, from E. V. Bird Constr. Co., Fayetteville, **$276,940.** CD 3/16—ENR 3/4.

●**Conn., Storrs**—State, Raymond A. Thatcher, comptroller, State Capitol, Hartford, Apr. 5,

MONEY-MAKING

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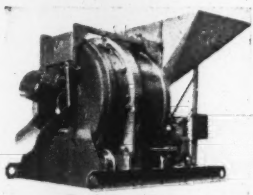

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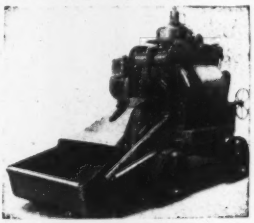

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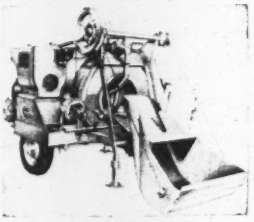

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Group C, 6 dormitories, Prof. B/A D-111, University of Connecticut, from Gilbane Constr. Co., 90 Calverly St., Providence, R. I. **$1,467,512.** CD 3/17—ENR 3/24.

Fla., Miami Beach—City Council, C. W. Tomlinson, clk., Mar. 30, auditorium, Washington Ave. and 17 St., from Bradford Builders, Inc., 1101 Lincoln Rd., **$735,800.** CD 3/10—ENR 3/17.

Kan., Syracuse—Bd. Educ., Mar. 30, high school, from M. W. Watson, Natl. Bank of Topeka Bldg., Topeka, **$385,000.** CD 4/16—ENR 4/24.

●**Minn., Mankato**—Bd. Educ., Loretta M. Viegel, clk., Apr. 6, general contract high school, from Hagstrom Constr. Co., 1567 Selby Ave., St. Paul, **$1,223,400.** CD 3/2—ENR 3/10.

Minn., Minneapolis—University of Minnesota, R. S. Callaway, purch. agt., 323 Administration Bldg., Main Campus, Apr. 1, general contract 4 story, brick, rein.-con. health service bldg., from Peterson Constr. Co., 620 National Bldg., **$183,900.** CD 3/9—ENR 3/17.

N. M., Portales—Eastern New Mexico College, Apr. 5, student union and women's dormitory, from C. S. Lambie & Co., Amarillo Bldg., Amarillo, **$540,737.** CD 3/1—ENR 3/3.

†**N. C., Fort Bragg**—U. S. Eng., 308 Custom House, Wilmington, Apr. 5, family housing units, Eng. 21-075-49-35, from Worth D. Kenyon, Capitol Club Bldg., Raleigh, **$333,632.** CD 3/4—ENR 3/31.

Tex., Houston—University of Texas, 701 Fannin St., Apr. 5, general contract boiler plant, from W. S. Bellows Constr. Co., 716 N. Everton St., **$136,658;** mechanical work, from C. Wallace Plumbing & Co., 4102 S. Shepherd Dr., **$403,611.** CD 3/21—ENR 3/24.

†**Utah, Monticello**—U. S. Atomic Energy Comn., Grand Junction, Colo., housing, incl. 6 bedroom staff house, three 3-bedroom houses, nine 2-bedroom houses, triple garage, five double garages and two single garages, from Gordon Supply Co., Moab, **$171,000.**

Wis., West Allis—Bd. Educ., 7510 W. National Ave., Zone 14, Apr. 4, general contract 4 story, bsmnt., 152x160½ ft. steel, concrete, brick steel Horace Mann High School, concrete fdn., from Jezo Constr. Co., 7232 W. Greenfield Ave., Zone 14, **$449,995.** CD 2/23—ENR 3/3.

CONTRACTS AWARDED

Calif., San Bernardino—San Bernardino Co., Courthouse, San Bernardino County Hospital, incl. boiler room and workshop, laundry addn., and storage bldg., to Kenneth Frazer, 707 S. Arroyo Parkway, Pasadena, **$423,000.** Bids 4/4. CD 3/22—ENR 3/24.

Conn., Manchester—Town, Bd. Educ., Manchester, 1 story, 10 room, Bunce School, Olcott St., to Alexander Jarvis Co., 6 Dover Rd., Manchester, **$624,300.** Bids 3/29. CD 3/15—ENR 3/17.

Fla., Gainesville—State Bd. Control, c/o contractor laundry, at Florida A. & M. College; to Glover Constr. Co., 880 E. Call St., Tallahassee, **$109,920.**

Ill., Mount Vernon—School Dist. 80, Mount Vernon, general contract 1 story, Field Grade School, to J. L. Simmons Co., Inc., 2146 N. Woodford St., Decatur, **$533,553.** Bids 3/1. CD 3/14—ENR 3/17.

●**Ia., Des Moines**—Bd. Educ., 629 3 St., Benjamin Franklin Junior High School, to Weitz Co., Inc., 406 Fleming Bldg., **$1,732,780.** Bids 3/29. CD 4/8—ENR 4/10.

Kan., Goodland — Bd. Educ., Goodland, school, to George Senne & Co., 510 E. 15 St., Topeka, **$250,000.** CD 12/1—ENR 1/6.

●**Mass., Somerville** — City Housing Auth., 34 North St., veterans housing, Clarendon Hill, to G. L. Rugo & Sons, Inc., 80 Boylston St., Boston, **$1,612,896.** Bids 2/3, awarded 4/5. CD 3/9—ENR 3/17, under LB.

Ore., Salem—School Dist. 24c-J., Salem, Capitol School and Four Corner School, to Henry G. Carl, Route 8, Box 13, **$264,396** and **$266,397** respectively. Awarded 4/6.

†**Alaska, College**—Pub. Bldgs. Admin., 18 and F Sts., Wash. 25, D. C., 3 story, 52x122 ft. rein.-con. geophysical institute bldg. on piling foundations and 6 houses at University of Alaska, to Lewis Constr. Co., Lowman Bldg., Seattle, Wash., **$720,332.** Bids 3/22, awarded 4/6. CD 3/29—ENR 3/31, under LB.

COMMERCIAL BUILDINGS

BIDS ASKED

April 20

Wis., Green Bay—St. Joseph of Carondelet, Green Bay, 2 story, bsmnt., 79 x 100 ft., steel brick academy and addns., and workshop rooms. Extended date. L. A. Geniesse 226 N. Washington St., archt. CD 3/23—ENR 3/31.

Bids After April 25

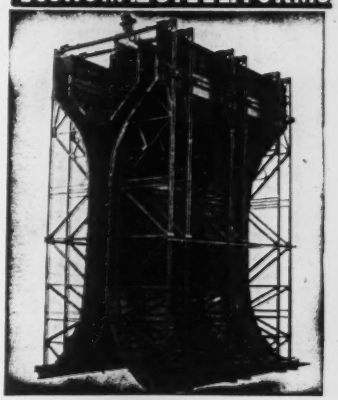
Ia., Davenport—American Legion Post No. 25, c/o Commander, 200 S. Perry St., rein.-con., brick American Legion Post headquarters, $335,000. Kruse & Parish, Kahl Bldg., archts. CD 12/15—ENR 12/30.

SOON LETS CONTRACT

N. C., Charlotte—American Trust Co., 204 S. Tryon St., soon lets contract bank. J. N. Pease & Co., 119½ E. 5 St., archts.

(Continued on page 169)

Another Job Showing the ADAPTABILITY of ECONOMY STEEL FORMS



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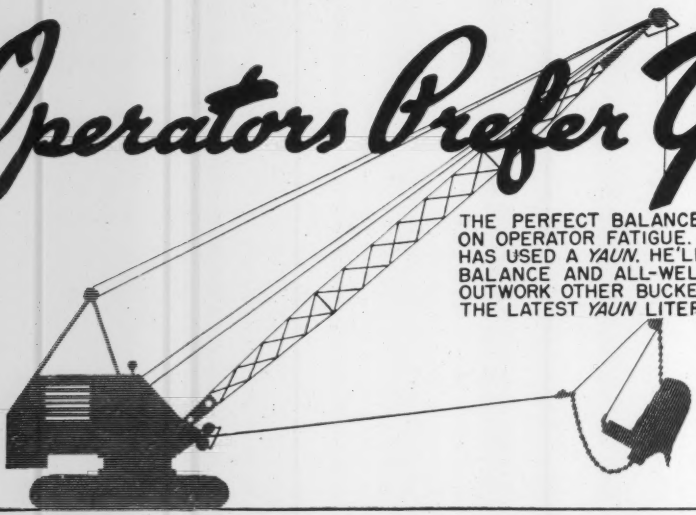

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(Continued from page 167)

LOW BIDDERS

Colo., Ft. Morgan—Ft. Morgan Community Hospital Assn., Ft. Morgan, rejected bids Apr. 6, general contract 2 story, 50 bed hospital, L. B. **$288,437.** CD 3/14—ENR 3/17, under LB.

La., Baton Rouge—Bendernagel & Cazale, archts., 8 Marlborough Gate, New Orleans, Mar. 31, 2 story, brick, parochial school addn., for Sacred Heart Church, from L. A. Spedale, 723 Richland Ave., Approx. **$256,200.** CD 3/21—ENR 3/24.

Neb., West Point—Sisters of Christian Charity, West Point, Apr. 5, general contract hospital, from Olson Constr. Co., 410 S. 7 St., Lincoln, **$749,199**; plumbing and heating from Suiter & Son, South Sioux City, **$149,950.** CD 3/17—ENR 3/24.

Ore., Prineville—Pioneer Memorial Hospital, Prineville, Apr. 6, 35 bed, concrete block, brick hospital, from Riverman & Sons, 2032 N. E. 48 St., Portland, **$264,900.** CD 3/23—ENR 3/31.

Va., Newport News—Calvary Baptist Church, Newport News, church alterations, addns., from Harwood Constr. Co., Newport News, **$255,000.** Williams, Coile & Blanchard, Newport News, archts.

●**Calif., San Jose**—Biebrach, Bruch & Moore, bedroom residences in Kirkland Villa section of Willow Glen, to Coastwise Constr. Co., 1800 Jonathan St., Approx. **$3,000,000.**

Ill., Chicago—Owner, c/o Harold A. Stahl, archt., 111 W. Monroe St., 3 story, brick apartment, 7217 S. Phillips Ave., separate contracts, masonry to Henning Johnson & Sons, 7649 S. State St., Approx. **$250,000.** Harold A. Stahl, 111 W. Monroe St., archt.

Ind., Indianapolis—PLANT—Mouldings, Inc., 730 E. Washington St., 1 story, brick, steel, concrete mfg. plant, S. Holt Rd. and Farnsworth Ave., to Industrial Operations, Inc. 219 N. Penn. St., Indianapolis, Approx. **$500,000.** Awarded 3/30.

●**Md., Baltimore**—Upland Apartments, Inc., 4625 Edmondson Ave. Unit B one hundred 2 story, brick, block housing, concrete slbs., separate contracts, **$1,699,750.** H. A. Miller, 337 St. Paul Pl., archt.

Md., Baltimore — Young Mens Christian Assn., 24 W. Franklin St., 4 story, brick, steel, rein.-con., Druid Hill Branch (colored) Y. M. C. A. bldg. 7, 1619 Druid Hill Ave., to The Davis Constr. Co., 320 W. 4 St., Zone 8, **$509,659.** Bids 1/13, awarded 4/7. CD 2/2—ENR 2/10, under LB.

N. C., Raleigh—Clark Avenue Apartments, Inc. c/o contractor, housing, Clark Ave., to York Bldg. Co., Capitol Club Bldg., Raleigh, Approx. **$450,000.**

●**N. Y., White Plains**—Sam Minnkoff & Sons, 521 Fifth Ave., New York, Zone 17, garden apartment development for 500 families on 31 acre site, Bryant and Mamarock Aves. Owner builds, **$2,000,000.**

O., Columbus — St. Joseph's Cathedral, Bishop Michael J. Ready, 212 E. Broad St., two 2 and 3 story, basmts., stone, limestone, steel and concrete floors, rectory bldgs.; remodeling Cathedral's sanctuary and sacristy, new 5th St. exit, etc., to Trapp Constr. Co., 536 S. Nelson St., Approx. **$500,000.** Bids 2/15, awarded 3/15. CD 2/4—ENR 2/10.

Tex., Dallas—Clearview Park, Inc., 2600 S. Hampton St., 200 dwellings, own forces. Approx. **$850,000.** Brown & Brown, 1905 N. Harwood St., archts. CD 3/16—ENR 3/31.

Tex., San Antonio—C. L. Browning, Jr., 811 Insurance Bldg. 175 dwellings, off W. W. White Rd., force account. Approx. **$950,000.** CD 4/1.

INDUSTRIAL BUILDINGS

BIDS ASKED

April 19

Minn., Duluth—WAREHOUSE, etc.—W. H. Ziegler Co., 304 Lake Ave. S., J. G. Lewis, vice pres., soon lets contract 2 bldgs., one 1 story, 161x181 ft. and other 1 story, 43x62 ft. concrete warehouse, office, shop. $150,000. Extended date. Hansen & Dubberman, 205 Telegram Bldg., Superior, Wis. archts. CD 4/8—ENR 4/14.

Bids Asked

Conn., Waterbury — TRUCK GARAGE — Borck & Stevens, 325 Housatonic Ave., Bridgeport, 1 story, 85x162 ft., steel, cinderblocks, truck garage, Meriden Rd. $70,000. Fletcher Thompson, Inc., 211 State St., Bridgeport, archt.

SOON LETS CONTRACT

N. C., Winston-Salem—WAREHOUSE—Atlas Supply Co., 226 S. Liberty St., soon lets contract 4 story, warehouse addn. Macklin & Stinson, 226 N. Trade St., engrs. and archts. Extended date. CD 3/30—ENR 4/7.

Proposal Advertisements see pp. 169 to 171 and 191—Proposed Projects see p. 132

OFFICIAL PROPOSALS

Bids: May 2, 1949 (973)

Clearing, Grading and Drainage System of Airport

The Puerto Rico Transportation Authority will receive sealed bids for Clearing, Grading and Drainage System of the Puerto Rico International Airport, Projects No. 9-53-001-701 and No. 9-53-001-902 San Juan, Puerto Rico, until *2:00 P. M.* (Atlantic Standard Time) on the *second* day of *May*, 1949, at San Juan, Puerto Rico, at which time and place all bids will be publicly opened and read aloud.

The bidders will be required to submit proposal for both projects. Proposal for only one of the Projects will not be accepted.

The successful bidder will be required to furnish satisfactory performance and payment bond or bonds.

All bids shall be based on wage rates not less than the minimum wage rates as predetermined by the Secretary of Labor of the United States, schedule of which is included in the Specifications.

Attention is called to the fact that the project is exempted from the 3% Insular tax on public works contracts.

Proposed forms of contract documents, including plans and specifications, are on file at the office of the Chief Engineer of the Puerto Rico Transportation Authority, at San Juan, Puerto Rico.

Copies of the documents may be obtained by depositing $100.00 with the Puerto Rico Transportation Authority for each set of documents so obtained. The amount of the deposit will be refunded to each person who returns the plans and documents in good condition within 10 days after the opening of bids.

The Puerto Rico Transportation Authority reserves the right to reject any or all bids and waive any informalities in bidding.

A certified check or bank draft payable to the Puerto Rico Transportation Authority, U. S. Government Bonds, or a satisfactory bid bond executed by the bidder and acceptable sureties in an amount equal to (5%) five per cent of the bid shall be submitted with each bid.

SALVADOR V. CARO
General Manager

Bids: May 2, 1949 (980)

Utility Services for Hangars No. 3 and No. 4

THE PORT OF NEW YORK AUTHORITY
NEW YORK INTERNATIONAL AIRPORT
CONTRACT NYA-20

Sealed proposals for the furnishing and installation of utility services for Hangars No. 3 and No. 4 at New York International Airport, will be received at the office of the Chief Engineer of The Port of New York Authority, Room 1100, 111 Eighth Avenue, New York 11, N. Y., until 2:00 o'clock on the afternoon of Monday, May 2, 1949, and thereafter in the Auditorium of the Authority at the same address until 2:45 P.M. on the same date, at which latter time and place said proposals will be publicly opened and read.

Contract documents may be seen at the office of the Chief Engineer, and copies will be furnished upon deposit of $25.00 per set. The deposit will be remitted if the documents are returned in good condition, not later than thirty days after the opening of proposals.

THE PORT OF NEW YORK AUTHORITY
Howard S. Cullman,
Chairman

New York, April 14, 1949

Bids: May 2, 1949 (983)

Access Roads and Parking and Storage Areas for Federal Building

THE PORT OF NEW YORK AUTHORITY
NEW YORK INTERNATIONAL AIRPORT
CONTRACT NYA-34

Sealed proposals for the construction of access roads and parking and storage areas for the Federal Building at New York International Airport, will be received at the office of the Chief Engineer of The Port of New York Authority, Room 1100, 111 Eighth Avenue, New York 11, N. Y., until 2:30 P. M., Monday, May 2, 1949, and thereafter in the Auditorium of the Authority at the same address until 3:00 P. M., on the same date, at which latter time and place said proposals will be publicly opened and read.

Contract documents may be seen at the office of the Chief Engineer, and copies will be furnished upon deposit of $25.00 per set. The deposit will be remitted if the documents are returned in good condition, not later than thirty days after the opening of the proposals.

THE PORT OF NEW YORK AUTHORITY
Howard S. Cullman,
Chairman.

New York, April 14, 1949.

Bids: April 28, 1949 (982)

Switch House for Runways A, B, C and V

THE PORT OF NEW YORK AUTHORITY
NEW YORK INTERNATIONAL AIRPORT
CONTRACT NYA-40

Sealed proposals for the construction of a switch house for runways A, B, C and V at New York International Airport, will be received at the office of the Chief Engineer of The Port of New York Authority, Room 1100, 111 Eighth Avenue, New York 11, N. Y. until 2:00 P. M., Thursday, April 28, 1949, and thereafter in the Auditorium of the Authority at the same address until 2:30 P. M., on the same date, at which latter time and place said proposals will be publicly opened and read.

Contract documents may be seen at the office of the Chief Engineer and copies will be furnished upon deposit of $10.00 per set. The deposit will be remitted if the documents are returned in good condition, not later than thirty days after the opening of proposals.

THE PORT OF NEW YORK AUTHORITY
Howard S. Cullman,
Chairman.

New York, April 14, 1949.

U. S. Government

UNITED STATES DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. 2628) will be received by Bureau of Reclamation, Denver, Colorado, May 10, 1949, and then publicly opened for furnishing two 20,000-kva. 110-kv to 12.47-kv, forced-air-cooled, outdoor, package-type substations; complete for ED2 and ED4 substations, Davis Dam Project, Arizona-Nevada. Delivery is desired within 700 days. For particulars, address Bureau of Reclamation, Building 1-A, Denver Federal Center, Denver, Colorado.

MICHAEL W. STRAUS, Commissioner.
(981)

(Continued on page 170)

Contractors Watch This Section —

for new projects. Publish your announcements through the proposal sections of *Engineering News-Record* and get their bids.

U. S. Government
(Continued from page 169)

BIDS FOR BANK GRADER UNITS—Memphis District, Corps of Engineers, P.O. Box 97, Memphis 1, Tenn. Sealed bids will be received here until 11:00 a.m., C.S.T. 26 April 1949, and then publicly opened, for furnishing two mechanical bank grader units each consisting of: a 185' boom diesel electric dragline grader machine; a steel grader barge 130' x 70' x 8'-6"; and a steel mooring barge consisting of 2 sections each 200' x 45' x 9', bolted and welded into one 400' unit. Deposit on plans: $10.00 for dragline grader machine, $15.00 for grader barge, and $15.00 for mooring barge. Information on request. (958)

UNITED STATES DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. 2624) will be received by Bureau of Reclamation, Denver, Colorado, May 5, 1949, and then publicly opened for furnishing 110,000/2,400-volt, 3,000-kva package-type substation equipment for the Hot Springs substation, Rio Grande Project, New Mexico-Texas. Delivery is desired within 1402 days. For particulars, address Bureau of Reclamation, Building 1-A, Denver Federal Center, Denver, Colorado.

MICHAEL W. STRAUS, Commissioner. (979)

OFFICIAL PROPOSALS

Bids: May 5, 1949 (978)

Construction of Sebago Bathing Development

LEGAL NOTICE

Sealed proposals will be received by the Palisades Interstate Park Commission until 3:00 P.M., E.D.S.T., May 5, 1949, for the third step in the construction of the Sebago Bathing Development, located in Harriman State Park, Orange and Rockland Counties, New York.

Work includes the construction of a 200,000 gallon reservoir, water and sewer pumping houses, with equipment, and appurtenant work.

Full information, plans, specifications and proposals may be secured at Administration Headquarters, Palisades Interstate Park Commission, Bear Mountain, New York. Payment for plans will be $10.00.

THE COMMISSION RESERVES THE RIGHT TO REJECT ANY OR ALL BIDS RECEIVED.

Bids: April 29, 1949 (977)

Construction of Mad River Interceptor

Waterbury, Connecticut

Sealed proposals for the construction of the Mad River Interceptor will be received by the Board of Public Works of the City of Waterbury, at its office in the City Hall until 7:00 o'clock P.M., Eastern Daylight Saving Time, on Friday, April 29, 1949, at which time they will be publicly opened and read.

The work to be done consists of the following:

CONTRACT 1—Includes approximately 5,555 lineal feet of reinforced concrete pipe intercepting sewer 20 to 42 inches in diameter in and near the bed of the Mad River and in city streets and factory yards.

CONTRACT 2—Includes approximately 2,880 lineal feet of reinforced concrete pipe intercepting sewer 30 inches in diameter in factory railroad yard.

Proposals may be submitted for each contract separately or on a combined basis.

Plans, contract, and specifications may be obtained by intending bidders applying at the office of the Bureau of Engineering, City Hall, Waterbury, Connecticut or at the office of Malcolm Pirnie Engineers, 25 West 43rd Street, New York, N. Y., on deposit of twenty-five dollars ($25.00), which sum will be refunded to those submitting bids upon return of plans and specifications in good condition within ten (10) days after award of contract. Non-bidders will receive a refund of fifteen dollars ($15.00) on return of plans and specifications.

OFFICE OF BUREAU OF ENGINEERING
WATERBURY, CONNECTICUT
Henry C. Whitlock, City Engineer

OFFICIAL PROPOSALS

Bids: April 20, 1949 (960)

State Road Work

NOTICE TO CONTRACTORS: STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.—Pursuant to the provisions of Chapter 63 Laws of 1936, as amended, and special provisions for projects financed with federal aid funds, sealed proposals will be received until ten-thirty o'clock A. M., eastern standard time on *Wednesday, April 20, 1949* by Henry A. Cohen, Director, Bureau of Contracts & Accounts, *14th* Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y., for the following projects: Maps, plans, specifications and proposal forms may be seen and obtained at the office of the State Department of Public Works, Bureau of Contracts & Accounts, Albany, N. Y., and at the office of the District Engineers noted below, and may also be seen at the office of the State Department of Public Works, 270 Broadway, New York City.

The deposit for plans and proposal forms for each contract containing 1 to 15 sheets is $5.00; 16 to 30 sheets, $10.00; over 30 sheets, $20.00. A refund will be made in full to bidders for the return of one set in good condition within 30 days of award or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.

County	Contract No.	Name	Miles	Type	Deposit	Estimated Cost of Work
		DISTRICT No. 1				
		G. L. Nickerson, Dist. Engr., 333 Broadway, Albany, N. Y.				
Essex	RC 49-36	Saranac Lake-Bloomingdale, S. H. 821 Saranac Lake Vill.-Bloomingdale Vill., S. H. 929	6.94	Asph. Conc. Opt.	$10,000 Plans $5.00	$172,000
Washington	RC 49-37	Adams-Middle-Hartford, S. H. 8101	5.68	Road Mix	$7,500 Plans $5.00	$147,000
Warren	FASS 49-4	Sodom-No. Creek, Co. Rd. 29, Proj. S223(1)	3.90	I-Beam 41' 81" Conc. Slab 27' Bit. Tr. Gravel	$16,000 Plans $10.00	$275,000
		DISTRICT No. 2				
		L. Ketchum, Dist. Engr., 100 No. Genesee St., Utica, N. Y.				
Herkimer	RC 49-38	Old Forge-Eagle Bay, Pts. 1 & 2, S. H. 8180	4.76	Asph. Conc. Opt.	$7,000 Plans $5.00	$134,000
		DISTRICT No. 3				
		Wm. Robinson, Dist. Engr., 301 E. Water St., Syracuse, N. Y.				
Onondaga	OT 49-3	Ont. Thru. Sys. of Gr. on Hopkins Rd., Vine St., N. Y. C. R. R., Buckley Rd.	0.62	IB'S 2 @ 50'; Alpha 2 @ 66'; 2 @ 42'; Conc. Rig. Fr's 56', 43.5' Grd. & Struct.	$65,000 Plans $20.00	$1,117,000
		DISTRICT No. 4				
		A. R. Mulligan, Dist. Engr., Barge Canal Terminal, Rochester, N. Y.				
Genesee	RC 49-39	Bloomingdale Road, Indian Reservation)	0.02	(Alpha $65.80 Superstructure Composite Beam 64' 6"	$2,600 Plans $5.00	$46,000
		DISTRICT No. 5				
		C. R. Waters, Dist. Engr., 65 Court St., Buffalo, N. Y.				
Chautauqua	RC 49-40	North Clymer-Sherman, S. H. 8468	6.17	Bit. Mac. Pen. Tr. 1 3/8" on Asph. Conc. Opt. 0.08 on St. or Slag, D. S. T. 0.31 on	$11,000 Plans $5.00	$188,000
Erie	RC 49-22	Main Street, Pts. 3 & 4 S. H. 130 and S. H. 131	2.55	Asphalt Conc. Opt.	$6,000 Plans $5.00	$102,000
Niagara	PSC 7283	City of Lockport Lock St. & Grosding St. with N. Y. C. R. R.	0.26	I-Beam 48" Conc. 8" Thk. 44' Wdt.	$30,000 Plans $10.00	$547,000
		DISTRICT No. 6				
		H. F. Brumm, Dist. Engr., 30 West Main St., Hornell, N. Y.				
Steuben	RC 49-41	Colonton-Naples, Pt. 1, S. H. 3 561	3.36	Asph. Conc. Opt.	$12,000 Plans $5.00	$202,000
Chemung	RC 49-42	Horseheads-Corning State Hwy. 358 Horseheads-Montour Falls State Hwy. 5208 Horseheads-Cayuta State Hwy. 5432	3.82	Asphalt Conc. Opt.	$9,000 Plans $5.00	$157,000
Tioga	PSC 7088 & 8145	Elim. of Village Streets & Owego-Candor, Pt. 1, S. H. 5420 with Erie R. R.	0.22	Plate Girder 49' Reinf. Conc.	$45,000 Plans $10.00	$800,000
		DISTRICT No. 7				
		R. F. Hall, Dist. Engr., 444 Van Duzee St., Watertown, N. Y.				
Lewis	RC 49-17	Copenhagen, S. H. 937	3.51	Asph. Conc. Opt.	$5,000 Plans $5.00	$98,000
St. Lawrence	RC 49-18	Cranberry Lake-Sevseys cors., S. H. 8220	8.52	Asph. Conc. Opt.	$16,000 Plans $5.00	$276,000
		DISTRICT No. 8				
		J. S. Bixby, Dist. Engr., Pleasant Valley Rd., Poughkeepsie, N. Y.				
Orange	RC 49-43	Oxford-Chester, S. H. 5297	2.81	Asph. Conc. Opt.	$8,000 Plans $5.00	$143,000
Rockland	RC 49-44	N. J. State Line-Congers, Pt. 1, S. H. 8448, Congers-Long Clove, S. H. 5002, Rockland Lake-Long Clove, S. H. 8196	3.83	Asph. Conc. Opt.	$6,000 Plans $5.00	$114,000
Columbia	RC 49-45	Hudson-Brick Tavern, Ghent, S. H. 9067	6.31	Asph. Conc. Opt.	$16,000 Plans $5.00	$282,000
Westchester	CC49-1	Cross Co. Parkway to Hutchinson River Parkway Wartburg Conn.)	0.58	Rigid Frame 87' 6" Span, Ellip. Arch 50' 7" Span, Conc. Arch 53' 10" Span, Conc. 8" Thk., 24', 12' Var. Thk.	$5,000 Plans $20.00	$1,429,000
Dutchess	FARC 49-1	South S. H. 223 Project No. 1 49 F394 10	1.49	Asph. Conc. Opt.	$25,000 Plans $5.00	$465,000
		DISTRICT No. 9				
		F. W. Donovan, Dist. Engr., 71 Frederick St., Binghamton, N. Y.				
Delaware	RC 49-20	East Branch-Sullivan Line, Pt. 1, S. H. 5383	Co. 4.85	Asph. Conc. Opt.	$9,000 Plans $5.00	$155,000

(Continued on page 171)

OFFICIAL PROPOSALS

(Continued from page 170)

DISTRICT No. 10

J. J. DARCY, Dist. Engr., Montauk Hwy. at Little E. Neck Rd., Babylon, L. I., N. Y.

New York	FACBE 49-3	Cross Bronx Expy. (Cont.2X) Highbridge Park Connection Project No. U1084 (12)	0.22	Rigid Frame 87' 8" Conc. 9" Thk. 2 at 36', Var. Wdt.	$66,000 Plans $20.00	$1,200,000
New York & Bronx	FACBE 49-4	Cross Bronx Expy. (Cont. 3) Washington Br. Alterations Project No. U1084 (13)	0.36	Alterations to Br. Conc. 3" Thk. 2 at 33' Wdt.	$43,000 Plans $5.00	$850,000
Nassau	SSP 49-1	Southern State Parkway	4.36	Traffic Driver Misc.—1.82 mi. Asph. Conc. Opt.—2.54 mi.	$70,000 Plans $20.00	$1,000,000
Suffolk	NSP 49-1	Northern State Parkway	4.46	Conc. 8" Thk., 2 at 25'	$60,000 Plans $20.00	$1,000,000

Proposal for each contract must be submitted in a separate sealed envelope with the name and number of the contract plainly endorsed on the outside of the envelope. Each proposal must be accompanied by cash, draft or certified check payable to the order of "State of New York, Commissioner of Taxation & Finance" for the sum as specified in the advertisement and the proposal. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Highway Law, as set forth in "Instructions to Bidders".

When optional types are permitted on contracts with federal funds, bidders must state in the space provided in the proposal the exact designation of the optional type upon which the proposal is predicated.

The right is reserved to reject any or all bids.

B. D. TALLAMY
Supt. of Public Works

Bids: June 15, 1949 (976)

Yonge Street Subway

TORONTO, CANADA

Sealed tenders, endorsed "Tenders for Yonge Street Subway, Contract S-1" will be received by the Toronto Transportation Commission at its office, 35 Yonge Street, Toronto, until 11:00 o'clock, A.M. Eastern Standard Time, on Wednesday, June 15th, 1949.

The work for which such tenders are invited consists of building approximately 3400 lineal feet of subway of various sections, together with miscellaneous work appurtenant and collateral thereto, as specified in the Contract Documents and shown on the plans. The work is to be constructed generally by what is known as "Cut and Cover Method". The work is located in Front Street between York Street and Yonge Street, Yonge Street between Front Street and Queen Street, with a short section connecting the Front Street section with the Yonge Street section to be built on private right-of-way and passing under privately-owned and occupied buildings in the City of Toronto, as described in more detail in Requirements for Tendering and Instructions to Tenderers.

All tenders must be made upon blank forms of tender as furnished by the Toronto Transportation Commission and included in the Contract Documents, and shall be made in accordance with the provisions contained in said documents.

The successful tenderer will be required to furnish, execute and deliver to the Commission a performance bond satisfactory to the Commission in the amount and within the time set out in the Contract Documents.

The Contract Documents, including plans and specifications, are on file and will be available to tenderers at the office of the Toronto Transportation Commission, 35 Yonge Street, Toronto, on and after Thursday, April 14, 1949. Copies of the Contract Documents may be obtained by depositing One Hundred Dollars ($100.00) with the Commission for each set of documents. The amount of the deposit will be refunded upon return of the plans and documents in good condition within ten (10) calendar days after the opening of tenders.

Each tender must be accompanied by cash or a certified cheque on a chartered bank doing business in the City of Toronto, in the amount of One Hundred and Twenty-Five Thousand Dollars ($125,000.00) payable to the order of the Toronto Transportation Commission.

The Toronto Transportation Commission reserves the right to reject any or all tenders and to disregard any informalities in the tenders or tendering.

No tender may be withdrawn, after the scheduled closing time for receipt of tenders for at least forty-five (45) calendar days.

WILLIAM C. McBRIEN, Chairman,
TORONTO TRANSPORTATION COMMISSION

"Opportunity" Advertising:
Think
"SEARCHLIGHT"
First

Bids: April 26, 1949 (972)

Grading, Drainage, Structures and Paving

PENNSYLVANIA TURNPIKE COMMISSION
Harrisburg, Pennsylvania
NOTICE TO BIDDERS

Sealed proposals will be received by the Pennsylvania Turnpike Commission, through the Chairman, 11 North Fourth Street, Harrisburg, Pennsylvania, until 10:00 A.M. (Eastern Standard Time), the 26th day of April, 1949, and immediately thereafter will be taken to the Public Utility Commission's Hearing Room No. 1, North Office Bldg., Harrisburg, Pennsylvania, and immediately publicly opened and read aloud, for the following contract:

For construction of grading, drainage, structures, and paving of Turnpike Section 24A, part of the Philadelphia Extension, in South Londonderry Township, Lebanon County and Rapho and Penn Townships, Lancaster County, Commonwealth of Pennsylvania. This section being situated as follows:

Beginning at a point 260 feet West of Legislative Route 38032 in South Londonderry Township, at Turnpike Station 209+10 (Lebanon County) thence in an Easterly direction 28,124 feet to a point 3,850 feet East of the Reading and the Cornwall Railroads, Penn Township, at Turnpike Station 196+25 (Lancaster County) a distance of approximately 5.33 miles.

Approximate quantities of the principal items are as follows:

Class I Excavation	1,120,000 Cubic Yards
Class II Excavation	36,000 Cubic Yards
Reinforced Concrete Pavement	166,000 Square Yards
Class A Concrete	3,800 Cubic Yards
Class B Concrete	4,800 Cubic Yards
Plain Steel Bars	802,000 Pounds
Fabricated Structural Steel	877,000 Pounds

Copies of plans, specifications and other contract documents, including cross-sections, are on file and open to public inspection at the offices of the Pennsylvania Turnpike Commission located at Harrisburg, Pennsylvania, on 8 April 1949. Copies of cross-sections may be purchased from the Pennsylvania Turnpike Commission for the sum of Fifty Dollars ($50.00) per set.

Specifications and contract documents, exclusive of cross-sections, may be obtained from the Commission upon deposit of Ten Dollars ($10.00) for each set, such deposits to be refunded in full to any actual bidder upon return of such documents in good condition within five (5) days after the date of the opening of the bids. Refund will be made for all plans, contract documents and cross-sections returned, if the project is withdrawn from letting by the Pennsylvania Turnpike Commission. Remittances are payable to the Pennsylvania Turnpike Commission and must accompany requests for drawings, specifications and cross-sections.

The character and amount of bid security to be furnished by bidder is stated in the Instructions to Bidders.

No bids may be withdrawn for thirty (30) days after the scheduled closing time for receipt of bids.

PENNSYLVANIA TURNPIKE COMMISSION
James F. Torrance
Secretary and Treasurer

Harrisburg, Pennsylvania
1 Apr 49

OFFICIAL PROPOSALS

Bids: April 29, 1949 (946)

Sewerage System and Treatment Plant

The Municipal Authority of the Borough of Mechanicsburg, Penna.

Sealed proposals will be received at the Municipal Building, Mechanicsburg, Penna., until 2:00 P.M., E.S.T. April 29, 1949 for furnishing all necessary labor, materials and equipment, and performing all work for the construction of a Sewerage System and a Sewage Treatment Plant and appurtenances, and will there be publicly opened and read at that time. Separate proposals will be received upon two parts of the project as follows:

Sewerage System—Including 8,000 lin. ft., 8" to 18" vitrified sewers; 20,700 lin. ft., 6" vitrified sewer house connections; 340 manholes and other appurtenances.

Sewage Treatment Plant—including Control Building, Primary and Secondary Clarifiers, Primary and Secondary Biofilters, Recirculation Pumping Station, Chlorine Contract Tank, Sludge Digester, Sludge Drying Beds, Roads, Fencing and Specified Equipment and Appurtenances.

Proposals shall be accompanied by certified checks in accordance with the provisions contained in the Specifications and in the following amounts:

Sewerage System—$30,000
Sewage Treatment Plant—$10,000

Copies of the Contract Documents, Plans and Specifications may be obtained from Gannett Fleming Corddry and Carpenter, Inc., Consulting Engineers, 600 North Second Street, Harrisburg, Penna., upon deposit of the following amounts for each set:

Sewerage System — Twenty Dollars ($20.00)

Sewage Treatment Plant—Fifteen Dollars ($15.00)

Full refund will be made to actual bidders for return of one set in good condition within ten days after closing date for receipt of bids; refund for return of all other sets, in good condition within the same period, will be fifty per cent of the deposit.

Gannett Fleming Corddry &
Carpenter, Inc., Engrs.
600 North Second Street
Harrisburg, Penna.

The Municipal Authority of the Borough of Mechanicsburg, Penna.

Bids: May 6, 1949 (971)

Overpeck Valley Joint Sewage Works

Sealed bids will be received by the Bergen County Hackensack River Sanitary Sewer District Authority at the Bergen County Administration Building, Hackensack, N. J. until 8:00 P.M., Friday, May 6, 1949, for contract 1 and contracts 6 through 18, and at said place and time will be publicly opened and read aloud.

Drawings and specifications may be examined at the offices of the authority, Bergen County Administration Building, or at the offices of Bogert-Childs Engineering Associates, 624 Madison Avenue, New York 22, N. Y.

Copies of the Contract documents may be obtained at these offices upon payment as follows:

Cont. 1. Drawings $50.
Cont. 1. Specifications $10.
Conts. 6-18. Drawings $10 per contract.
Conts. 6-18. Specifications $10.

New applicants will be denied copies after 5:00 P.M., May 3, 1949.

Upon return of contract documents within 2 weeks after receipt of bids, a bidder will be refunded his deposit and a non-bidder, 50 percent.

Each bidder must deposit with his bid, security in an amount of not less than five per centum (5 percent) of the base bid as provided in the information for bidders.

No bidder may withdraw his bid within 60 days after May 6.

By order of The Bergen County Hackensack River Sanitary Sewer District Authority

Arthur W. Kneerim
Treasurer and Acting Secretary.
March 17, 1949.

SEARCHLIGHT SECTION

EMPLOYMENT • BUSINESS • OPPORTUNITIES • EQUIPMENT—USED or RESALE

UNDISPLAYED RATE:
(Not available for equipment advertising)
$1.20 cents a line, minimum 4 lines. To figure advance payment count 5 average words as a line.
INDIVIDUAL EMPLOYMENT WANTED undisplayed advertising rate is one-half of above rate, payable in advance.
PROPOSALS, $1.00 a line an insertion.

INFORMATION.
BOX NUMBERS care publication New York, Chicago or San Francisco offices count as 1 line additional in undisplayed ads.
DISCOUNT of 10% if full payment is made in advance for four consecutive insertions of undisplayed ads (not including proposals).

DISPLAYED—RATE PER INCH:
The advertising rate is $11.50 per inch for all advertising appearing on other than a contract basis. Contract rates quoted on request.
AN ADVERTISING INCH is measured 7/8 inch vertically on one column, 3 columns—30 inches —to a page. E.N.R.

NEW ADVERTISEMENTS received by April 19th appear in April 28th issue subject to limitation of space available.

WANTED ENGINEERS

Senior Associate Grades . . . . . $6191 to $6908 per year
Associate Grades . . . . . $5341 to $6058 per year
Senior Assistant Grades . . . . . $4570 to $5048 per year

In Architectural, Civil, Sanitary, Electrical, Mechanical and Structural Specialties.

To prepare plans, specifications and drawings and to supervise construction on a $38,000,000.00 water system expansion program and other municipal projects.

Placement to be made from lists of applicants qualifying in examinations to be held April 22, 1949.

Apply immediately stating background and experience, also grade and specialty in which you are interested, to

DETROIT CIVIL SERVICE COMMISSION
15th Floor, Water Board Building Detroit 26, Michigan

WANTED
CHIEF DRAFTSMAN

age 25 to 50, structural design background with broad supervisory design experience on tunnels, bridges, harbors and municipal work, by Southern engineering firm. Must be able to work with management, lead men and get results. Salary commensurate with ability. Submit record education, experience, availability and references to

P-8532, Engineering News-Record
520 North Michigan Ave., Chicago 11, Ill.

WANTED—Mechanical and Structural Engineers For designing and detailing work on concrete reinforcement, structural steel and hangar door construction. Requirements are three to four years practical experience or recent graduation from technical school. Desirable working conditions and opportunities for advancement. These openings are with a nationally known steel fabricating company, located in eastern Ohio. Applicants will please submit a record of their qualifications.
P-7737, Eng. N-R, 520 N. Mich. Ave., Chicago

ESTIMATOR

Wanted by expanding concern doing underground power, telephone conduit, water and gas main construction in Boston, Mass. Experienced man preferred. Permanent position. Excellent opportunity for right party. State qualifications, exp., age, former employers references and salary req.

P-8489, Engineering News-Record
330 W. 42nd St., New York 18, N. Y.

WANTED MAY 1ST
Engineering Graduate, qualified to direct aggregate production in Northwest in connection with large dam project. Deposit located 60 miles from town of any consequence. Must be aggressive and able to supervise project accounting, purchasing, and labor relations. Right man can be built up with this experience as valuable asset to our organization. Write
P-8377, Engineering News-Record
520 N. Michigan Ave., Chicago 11, Ill.

WANTED
GRADUATE ELECTRICAL ENGINEERS

Of varying experience for electrical transmission and distribution engineering and design. Location, Western Pennsylvania. Qualifications, experience record, and picture should be submitted with letter of application.
P-8623, Engineering News-Record
330 West 42nd Street, New York 18, N. Y.

WANTED
GRADUATE MECHANICAL ENGINEERS

For Power Station engineering and design. Location, Western Pennsylvania. Qualifications, experience record, and picture should be submitted with letter of application.
P-8624, Engineering News-Record
330 West 42nd Street, New York 18, N. Y.

WANTED—Experienced "GUNITE" man to act as working foreman.

Permanent position Florida. Salary and bonus arrangement. State qualifications, experience, references, availability and all pertinent information in first letter.

TWENTIETH CENTURY BUILDERS
401 N. 13th Street, Tampa, Florida

GRADUATE ENGINEER—WANTED
Graduate engineer with extensive experience in supervising first, second and third class building construction and having a good knowledge of road and utility work. Must be thoroughly capable of supervising field engineers in a program spending several million dollars. Full management of office records and reports also part of duties. Excellent remuneration to qualified man. State age, experience and qualifications in reply.
P-8613, Engineering News-Record
330 West 42nd Street, New York 18, N. Y.

REPLIES (Box No.): Address to office nearest you
NEW YORK: 330 W. 42nd St. (18)
CHICAGO: 520 N. Michigan Ave. (11)
SAN FRANCISCO: 68 Post St. (4)

CIVIL SERVICE

WANTED: MAN to supervise construction program for Texas prison system two to three years. Must be able to take full charge of office and field. Apply to O. B. Ellis, Huntsville, Texas giving full particulars.

WANTED: ENGINEER-Estimator able to take off quantities for purchasing. Apply O. B. Ellis, General Manager Texas Prison System, Huntsville, Texas.

POSITIONS VACANT

WANTED—ENGINEERS, Architects, Draftsmen experienced in the design of sewers, sewage treatment plants, water treatment plants and industrial buildings. Also engineers to supervise construction. State qualifications, experience, salary requirements and date available. P-1155, Engineering News-Record.

STRUCTURAL STEEL Designer and Estimator wanted by leading central west fabricator. Permanent position and good opportunity with large well established and growing company. Please state qualifications, past experience and salary requirements. P-8386, Engineering News-Record.

ESTIMATOR AND Sales—Norfolk, Virginia. Salary base with at least 15 years experience in take off pricing and selling in structural and ornamental iron shop. Also one thoroughly experienced structural draftsman. Permanent position. P 8563, Engineering News-Record.

CONTRACTOR'S ASSISTANT—Young, growing firm of general contractors wants an aggressive engineer to handle purchasing and engineering work on commercial and public buildings. Graduate preferred. Permanent position. No traveling. Midwestern location. Salary open. P 8556, Engineering News-Record.

GENERAL CARPENTER Foreman wanted by Contractor operating extensively in the Middle West. Must be good form man, capable of designing form systems and laying out his own work on heavy construction jobs and buildings ranging from $500,000 to $2,000,000 in size. P 8578, Engineering News-Record.

MEN WANTED: Party chiefs and instrumentmen for transmission line traverse and profile surveys. Stanley Engineering Co., Hershey Building, Muscatine, Iowa.

SUPERINTENDENT FAMILIAR with long span reinforced concrete bridge work. Location Eastern Pennsylvania. Send complete resume of record, recent snapshot, salary and availability. P 8573, Engineering News-Record.

ENGINEER, CIVIL, experience in surveying, drafting, quantity estimating and field supervision. Write P.O. Box 755, Langley Field, Va.

WANTED: GENERAL Superintendent and Quarry Foreman with granite experience. Two year job in Southeast. State salary and experience. P-8581, Engineering News-Record.

WANTED: MAN with some experience in estimating steel windows from architects' plans and in making detail drawings for architects' approval. State age, experience and salary desired. P 8628, Engineering News-Record.

POSITION VACANT

LARGE NEW York Construction Company has vacancy for Chief Estimator. Must be familiar with all types of construction and have had a minimum of fifteen years experience. State complete qualifications and include photograph. P-8375, Engineering News-Record.

(Continued on opposite page)

WANTED Draftsmen—

ARCHITECTURAL and STRUCTURAL

Experienced in industrial building. Applicants please state age, education, previous experience and salary desired. Photograph or snapshot not returnable.

AMERICAN ENKA CORPORATION
ENKA, N. C.
(near Asheville)

ENGINEERS WANTED

Architectural, Civil and Other Specialties are urgently needed by the City of Detroit to prepare plans, specifications and drawings and to supervise and inspect construction on a wide variety of municipal projects. Salary ranges from $3139 to $3590 and $3908 to $4385 a year for a 40 hour week. For information address the

DETROIT CIVIL SERVICE COMMISSION
15th Floor, Water Board Building
Detroit 26, Michigan

MAN WANTED

SALES ENGINEER

For selling and promoting asphalt construction and materials. Permanent position and excellent opportunity for right man. State qualifications and references.

SW-8369, Engineering News-Record
520 N. Michigan Ave., Chicago 11, Ill.

SALESMAN

With civil or mechanical engineering background, Italian speaking desirable, to follow contracting trade for sale and rental of Construction Machinery in Metropolitan N. Y. area; car furnished, drawing and commission. Write full details.

SW-8572, Engineering News-Record
330 W. 42nd St., New York 18, N. Y.

SALESMAN WANTED

having good contacts among large general contractors in the construction line to sell lumber. Capable of producing substantial business. Experience in lumber business not essential. Write stating age.

SW-8643, Engineering News-Record
330 West 42nd Street, New York 18, N. Y.

WHEN
Answering Advertisements

PLEASE *do not send original letters, certificates or photographs. We cannot be responsible for their return. Please send photostat or carbon copies.*

SALARIED POSITIONS $3.500—$35,000

If you are considering a new connection communicate with the undersigned. We offer the original personal employment service (39 years recognized standing and reputation). The procedure, of highest ethical standards, is individualized to your personal requirements and develops overtures without initiative on your part. Your identity covered and present position protected. Send only name and address for details.

R. W. BIXBY, Inc., 272 Dun Bldg., Buffalo 2, N.Y.

SELLING OPPORTUNITY OFFERED
(Continued from opposite page)

SALES ENGINEER With engineering or architectural training. Experience in sales and estimating of reinforcing bars and steel windows preferred. Location Southeast. State: salary, age, experience, availability and enclose recent snap shot. Southern G F Company, 263 Decatur St., S. E., Atlanta, Georgia.

EMPLOYMENT SERVICE

SALARIED PERSONNEL, $3,000-$25,000. This confidential service established 1927, is geared to needs of high grade men who seek a change in connection under conditions assuring, if employed, full protection to present position. Send name and address only for details. Personal consultation invited. Jira Thayer Jennings, Dept. L, 241 Orange St., New Haven, Conn.

POSITIONS WANTED

CIVIL ENGINEER Graduate—Registered and experienced mining engineer. Age 27. Domestic or foreign location; single, no dependents and available on short notice. PW-8480, Engineering News-Record.

GENERAL FOREMAN, shaft, tunnel, quarry, dam, sewer, close, open. General excavation rock. Speak Spanish. PW-8374, Engineering News-Record.

CIVIL ENGINEER—Graduate-Registered, 30 years age. 8 years experience location and topographic surveys, highways, pipelines, heavy construction. Desire position with contractor or engineer in California or nearby state. Available immediately. PW-8566, Engineering News-Record.

CONSTRUCTION SUPT. Civil engr. graduate; 31. Experience includes Field Supt. on large building project. Carpenter and Concrete Foreman on various heavy construction projects. 3½ years Navy Seabees officer. Presently building estimating. Desire permanent association with heavy-building construction contractor in field supervision where opportunity exists for progressive responsibility. PW-8567, Engineering News-Record.

CIVIL ENGINEER, 20 years experience in bridges, highways, sewers, reports, design, construction and administration. Desires permanent position. Mid-West preferred. PW-8408, Engineering News-Record.

SUPT. OR Assistant, shaft, tunnel, dam; quarry, sewer, tunnel, mine, shaft pit, rock specialist. Speak Spanish. Central South America. PW-8372, Engineering News-Record.

ENGINEERS AND FOREMEN

A group of experienced American design and construction engineers as well as a superintendent and various foremen who have worked together in Venezuela for some years on a large project now terminating are interested in forming the nucleus for design and/or construction work sponsored by a prominent American contractor or consulting engineer. Preferred work includes all phases water supply, sewerage or heavy waterfront construction anywhere in Latin America. Open for propositions on salary, contract, or profit sharing basis. Experience records available upon request.

PW-8660, Engineering News-Record
330 W. 42nd Street, N. Y. 18, N. Y.

AVAILABLE
INSPECTOR

CONCRETE and STEEL
Arctic and Tropic Experience

PW-8651, Engineering News-Record
330 West 42nd Street, New York 18, N. Y.

POSITIONS WANTED

SUPT. SHAFT, tunnel, sewer, open, closed. Dam, quarry, general excavating rock. PW-8373, Engineering News-Record.

SURVEYOR, DRAFTSMAN, title surveys experience—construction work. PW-8574, Engineering News-Record.

CONSTRUCTION ENGINEER—Field, Administrative, over 30 yrs. experience organizer, liaison, cost and progress scheduling. Grad. Engr. Licensed. Former positions designer, const. supt., chief engr., project mgr. Industrial, heavy const., housing. Available 3 weeks. U. S. PW-8538, Engineering News-Record.

PROJECT MANAGER: General, Job Superintendent; 30 years experience; heavy and light construction; housing; apartments; schools; hospitals; office buildings; chemical; industrial plants; powerhouses; handle all trades including mechanical and allied work. PW-8576, Engineering News-Record.

ACCOUNTANT, 54 desires location. Prefer foreign. 33 years bookkeeping, cost accounts and other essential. 5½ years in Tropics. Have some knowledge of Spanish. Valid passport. P. O. Box 124, Lenoir City, Tenn.

STRUCTURAL DESIGN Engineer, Graduate C.E., Age 45, 23 years experience designing steel, concrete and timber structures, together with any type of foundation. Thoroughly competent to execute complete structural designs on any type building or waterfront structure and supervise the execution of working drawings. Correspondence invited for position of responsibility PW-7208, Engineering News-Record.

CONSTRUCTION OFFICE, payroll, cost-accounting, bookkeeping, typist, 5 years experience, single. Write John Faul, 388 Boulevard, Bayonne, N. J.

STRUCTURAL ENGINEER, 20 years experience, building and tunnel design and supervision; any location considered. PW 8576, Engineering News-Record.

SANITARY, CIVIL Engineer, B.S., M.C.E., married, age 33. Desires permanent position in water supply, sewage treatment or as asst. city engineer. PW 8618, Engineering News-Record.

EXECUTIVE SECRETARY, Stenographer. Engineering office and construction field office experience. Familiar government contracts. Permanent position preferred—temporary considered. PW 8640, Engineering News-Record.

PURCHASING AGENT Or Material man, 30 years field experience in power house-bridges-river and harbor construction. States. PW 8606, Engineering News-Record.

ENGINEER, SANITARY, Civil Grad., 32, single. Experienced in operation and design of water and sewage systems and treatment plants and reinforced concrete design. Also interested in engineering sales and promotion. Available in 30 days. Pres. salary, $6400. Consider any U. S. location. PW 8647, Engineering News-Record.

CONSTRUCTION SUPERINTENDENT — 25 years all types industrial and chemical construction, inspection and liaison. Master mechanic on mechanical installation, piping, detailing and maintenance. Versatile, organizer, field and office management, purchasing, etc. Fine labor relations record and capable of handling problems. Travel, no preference as to location. PW-8664, Engineering News-Record.

CIVIL ENGINEER Graduate, age 27, 5 years experience, structural design detail in power plants and industrial buildings. Background as construction superintendent. Familiar with purchasing, estimating, and field as well as office work. Desires responsible position with contractor or consultant where opportunity for growth and expression is present. Willing to travel, metropolitan N. Y. area preferred. PW-8665, Engineering News-Record.

(Continued on page 174)

MARTINDALE'S
BEVEL ANGLES

Time saver for Drafting Room for Bins, Towers, Hip & Valley Roof Shop Details.

Typical connections and layouts. Formulas, graphs and tables of Bevel Angles for three dimensional connections.

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LEARN TO ESTIMATE

Today, more than ever before, you must know how to analyze building costs. If you want to become a successful builder, learn how to prepare a correct estimate in a hurry. Get in on the profitable work now available wherever you turn. Your success is assured if your estimates are right; otherwise you are licked before you start.

The Tamblyn System of Estimating will make a real estimator out of you in a few weeks of your spare time. We are so sure that you will want to learn it, that we will send you our complete home study course for ten days examination absolutely free. If you don't think it is the finest thing you ever saw, just return it and it won't cost you a cent. If you like it and want it, send us $8.75 when 10 days are up and $7.50 per month until $38.75 is paid.

This estimating system is based on forty years of actual construction experience. It has been sold all over the world for more than twenty years. Thousands of estimators and contractors swear by it. Our offer isn't hot air and big talk. We don't give you a diploma or a lapel button, but we do teach you down to earth estimating which will bring you profitable business.

Just send your name and address today, and we will mail you the complete course at once for your approval.

TAMBLYN SYSTEM
1115 So. Pearl St., E-281
Denver, Colo.

(Continued from page 173)

PART TIME WORK WANTED

ENGINEER-CIVIL—Registered P.E. desires part time structural work. Possible association small architectural college. PTWW-8654, Engineering News-Record.

SELLING OPPORTUNITY WANTED

SALES MANAGER—Engineer. Many years experience, successful record Building industry. Will represent manufacturer or Engineering service East Coast with New York headquarters. Can take complete charge. RA 8630, Engineering News-Record.

WORK WANTED

PLUMBING SUPT. and two first class pipe fitters with years of actual experience on all types of heavy construction, such as refineries, power houses, filtration plants, housing projects, sewer and water services are now available for foreign service anywhere in South or Central America. WW-8570, Engineering News-Record.

SPECIAL SERVICE

Let us handle your wire rope
cable splicing problems, chokers, slings, pendants, guys, etc. SS-8425, Engineering News-Record.

PATENT ATTORNEY

Patent Practice
before U. S. Patent Office. Validity and infringement investigations and opinions. Booklet and form "Evidence of Conception" forwarded upon request. Lancaster, Allwine & Rommel, Registered Patent Attorneys, Suite 454, 815-15th Street, N.W., Washington 5, D.C.

A COURSE OF INSTRUCTION BY MAIL IN
STRUCTURAL ENGINEERING
Thirty-ninth Year

(In the following list, Courses A, B, and C are abbreviated from our complete Structural Engineering course).
A—Public Works Structures.
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C—Special Course (State Board Exams. for P.E.)
D—Structural Engineering (complete).
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Our courses have helped thousands of men to better positions.
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Napoleon once said
"An Army Marches on Its Stomach"
We Have Fed Millions
KANE INDUSTRIAL SERVICE
Industrial Feeding.
Labor Camps.
Labor Camp Equipment.
Free Employment Agencies.
30 Years' Experience in the Housing and Feeding of Men for Satisfied Clients.
Abundant Labor Supply available for Large Projects Anywhere.
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SEATTLE: 316 Second Ave., South
MINNEAPOLIS: 105 Nicollett Ph: Atl 4845.

WANTED
Large engineering firm wishes to acquire several complete plants through purchase of (1) capital stock, (2) assets, (3) machinery and equipment, whole or in part. Personnel retained where possible, strictest confidence.
Box 1206
1474 Broadway New York 18, N. Y.

JOHN J. ABRAMSEN CO., INC.
200 W. 72 St., New York City *Endicott 2-7417-8*
RELOCATION and MOVING OF PLANTS, BRIDGES & BUILDINGS
CONSULT US—YOUR PROBLEM IS OURS

WANTED

WANT TO BUY *NEW SURPLUS*
VALVES & PIPE FITTINGS
EAST COAST VALVE & FITTING CO., INC.
725 FIFTH AVE. BROOKLYN 32, N. Y.

Compressors Wanted
STATIONARY - PORTABLE
LARGE OR SMALL
L. W. BAUER
22 Barnett Street Bloomfield, N. J.

WANTED
1—Used 60 Ton I Beam Trailer, with or without tractor unit.
A. S. WIKSTROM, Inc.
Skaneateles, N. Y.

WANTED
70 HP double drum electric hoist
Bucyrus-Erie 22-B Shovel
Bucyrus-Erie 22-B Dragline
Bucyrus-Erie 22-B Crane
Bucyrus-Erie 22-B Backhoe
Bucyrus-Erie 22-B Clamshell
Bucyrus-Erie 22-B Pile Driver
Bucyrus-Erie 22-B Trench Hoe
Bucyrus-Erie 22-B Concrete Mixer
Bucyrus-Erie 22-B Concrete Pump
Bucyrus-Erie 22-B Concrete Vibrator
Bucyrus-Erie 22-B Concrete Saw
Bucyrus-Erie 22-B Concrete Cutter
Bucyrus-Erie 22-B Concrete Breaker
Bucyrus-Erie 22-B Concrete Crusher
Bucyrus-Erie 22-B Concrete Screen
Bucyrus-Erie 22-B Concrete Conveyor
Bucyrus-Erie 22-B Concrete Elevator
Bucyrus-Erie 22-B Concrete Hopper
Bucyrus-Erie 22-B Concrete Bucket
Bucyrus-Erie 22-B Concrete Scraper
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Bucyrus-Erie 22-B Concrete Roller
Bucyrus-Erie 22-B Concrete Compactor

SALE

Starting April 2nd **$200,000.00** **Starting April 2nd**

CONSTRUCTION EQUIPMENT

Late Model Caterpillar Tractors — Cranes — Shovels and Front End Loaders

AT REDUCED PRICES *Loaded on Cars or Trucks—Net Prices*

- (1) D8 2U Series Caterpillar Tractor DDPCU and Angledozer
- (3) D8 2U Series Caterpillar Tractors DDPCU and Scrapers
- (2) D2 Caterpillar Tractors Traxson Front End Loaders
- (1) R2 Tractor with Hydraulic Bulldozer
- (1) D7 7M Series Caterpillar Tractor with PCU and Dozer
- (1) D7 9G Series Caterpillar Tractor with PCU and Dozer
- (1) Cleveland Trencher, Model 95, with Trailer
- (3) Concrete Mixers, 1 yd. capacity
- (2) Rubber Tired Front End Loaders
- (1) P & H Truck Crane
- (1) Byers ⅜ yd. Dragline
- (1) Northwest ¾ yd. Model 25 Diesel Engine Dragline
- (3) Double Drum Power Control Units
- (1) Push Dozer
- (1) 1½ yard Clam Bucket—new
- (1) ½ yard Clam Bucket—new
- (1) ¾ yard Dragline Bucket

Dozers for D-2, D-4 and D-6 Tractors—new

- (5) New Hydraulic Controlled Sand Spreaders

FIRST COME—FIRST SOLD

INSPECTION IN OUR YARD

The CHAS. M. INGERSOLL Co.

19930 Detroit Road • Cull EDison 1010 • Rocky River 16, Ohio

CONTRACTORS EQUIPMENT

150,000 GENUINE BURLAP SAND BAGS

With Tie string at top.

Suitable for sand bagging, barricading, bulkheading, flood control, fire control and shipping, etc.

ACORN BAG AND BURLAP CO.
915 No. Delaware Ave. Philadelphia 23, Pa.
Phone: WAlnut 2-7070

FOR SALE CHEAP

1—Schramm Diesel 315 cu. ft. 2 stage compressor, pneumatic tires, new 1947.
1—LeRoi Diesel 315 cu. ft. 2 stage compressor, pneumatic tires, new 1946.
1—LeRoi Gas 315 cu. ft. 2 stage compressor, steel wheels.

HARRY C. LEWIS
899 East Grand Street Elizabeth, N. J.

---

150 CRANES

CRAWLERS-CRUISERS-TRUCKS

LORAINS - LINKBELT SPEEDERS - P & H - BYERS - NORTHWEST - BAY CITY - OSGOOD - MARIONS - BUCKEYES - INSLEYS - UNITS - HANSON - QUICK-WAYS - OLIVERS

As Is

½ Yard, $2,500.00 to $3,500.00
¾ Yard, $3,500.00 Up—

ELLIS-NOVACK CO.
1925 N. Buena Vista, Burbank, Calif.
Phone Charleston 8-1641

FOR SALE

STEEL BUILDING

136 feet x 66—bolted—prefabricated—
OFF LOT TO HIGHEST BIDDER

NEWBURGH DOWNTOWN REALTY CORP.
Box 214 Newburgh, N. Y.

FOR SALE
Bucyrus-Erie
2½ cu. yd. Shovel

Model 54B.

Used for six months. Barley broke in. Available for immediate sale, good condition.

FS-8423, Engineering News-Record
330 W. 42nd St., New York 18, N. Y.

WANTED:
½ yd. Backhoe for 515 Unit Shovel
¾ yd. Backhoe for Hanson Model 65
Low Bed Trailer 20 to 40 Ton

FOR SALE:
1 Fruehauf Pole Trailer (Telescope 20 to 40 ft) Air Brakes
2 30 ft Trailer chassis, air, 12:00 Tire, 25 Ton, Unused
1 Cletrac Tractor, gas, Wis. Motor, 12 Volt Starter

W-8313, Engineering News-Record
330 W. 42nd St., New York 18, N. Y.

UNUSED
SURPLUS BUCKETS

Draglines

½ yd. Bucyrus Erie	$250.00	ea.
½ yd. Page	350.00	ea.
¾ yd. Link Belt	350.00	ea.
1½ yd. Page	650.00	ea.
2 yd. Erie	550.00	ea.

Clamshells

½ yd. Erie	350.00	ea.
¾ yd. Erie	425.00	ea.
¾ yd. Blaw Knox	525.00	ea.
¾ yd. Kiesler	525.00	ea.
1½ yd. Blaw Knox	800.00	ea.
2 yd. Johnson	850.00	ea.
2 yd. Blaw Knox	1250.00	ea.

FS-8634, Engineering News-Record
330 West 42nd St., New York 18, N. Y.

United States Department of the Interior, Bureau of Reclamation. Sealed bids will be received by W. C. Austin Project, Altus, Oklahoma until 10:00 A.M., May 3, 1949, then publicly opened for sale of surplus construction machinery and spare parts, consisting of 13 cy. Euclids, Steel Derrick, Bin Gates, Hoists, Electric Motors, Grouting Machine, Conveyors, Power Hammer, Paving Breakers, Screening Plant, Miscellaneous Plumbing Fittings, Welding Supplies, Tool Steel, Structural Steel, Caterpillar D-6 Spare Parts (New), Delco-Remy Generator Parts, Chevrolet Motor Parts, Bearings for Le Tourneau Carryall, and many other items. Project Engineer, Bureau of Reclamation, Altus, Oklahoma will supply bid form and detail list upon request.

3—MADSEN DRYERS

About 3 years old

6' x 28'—skid mounted with stack, burners, firebox, preheater & V-belt drive.

L. B. SMITH, INC.
Camp Hill, Pa.

SEARCHLIGHT SECTION

SHOVELS, CRANES, DRAGLINES
Buc-Erie 54B 2½ yd. Diesel Shovel.
Buc-Erie 120B, 5 yd. Elec. Shovel.
P & H 1055 Hi-Lift Diesel Shovel
Northwest-6 Diesel 1¾ yd. Shovel
Marion 111-M Hi-Lift 3-yd. Shovel-Diesel
Link-Belt Speeder LS-80, ¾ yd. Shovel-Diesel
P&H 1225 2½ yd. Electric Shovel.
Lorain 520 Diesel crane, 40 tons, 1943.
Lima 1201 Diesel Drag, 3¼ yds.
P & H 1055 Dragline Diesel 80' boom.
P & H 705 diesel dragline.
P&H 855B 2 yd. Diesel Shovel.
Manitowoc 2000B 1½ yd. diesel dragline.
Lorain dragline 78 diesel 75' boom.
Lorain MC4 moto crane, 1943. Excellent.
Lorain MC-414 Moto-Crane, 1948. New Condition.
Lorain MC-4 Moto-Crane. New 1943
Lorain MC-4 Moto-Crane. Rebuilt Condition

ROAD CONTRACTORS EQUIP.
Finisher Koehring Long, 20'—24'.
Finisher Blaw-Knox 10'—12'.
Port. 500 CFM Diesel Air Compressor.
Rooter 5½ ton LaPlant-Choate.
Blaw-Knox Concrete Spreader, 20'x24'.
Cat. 12 road grader 9K series.
Rooter LaPlante Choate 2 tine RP.
Road Forms 8000 ft. 9"x9".

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B-G Bit. Concrete Model 8S Mixing.
Cedar Rapids "Speedline".
Cedar Rapids Portable 20 Ton per hr.
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Koehring Model 304 ¾ yd. Shovel, Diesel powered. New 1946.

DRAGLINE SPECIAL
Bucyrus-Erie Monaghan Model 6W, 8 yd. Diesel Dragline 150' Boom

TRACTORS:
FACTORY NEW D-8 2U Series with D.D.P.C.U. and Bulldozer.
Caterpillar D7 Traxcavator 2T Series with 1 yd. Bucket.
Caterpillar D7 with Hydraulic Angledozer, 3T Series. Excellent Condition
Caterpillar D7, Cable controlled, 3T Series with Angledozer
Caterpillar D-2 Traxcavators with ¾ yd. Bucket with Bulldozer blade. Worked 700 hours.
Caterpillar D8, 2U series, about one year old, with D.D.P.C.U. and angledozer
Caterpillar D8, SR series, D.D.P.C.U. and angledozer blade.
International TD18, with LeTourneau double drum unit. New in late 1946.
Allis-Chalmers HD-19H with angledozer blade. New July 1948.
Int. TD18 with Heil angledozer Trail Builder with D.D.P.C.U. New Nov. 1947.

GRADERS:
Warco Motor Grader, new September 1947.
Caterpillar, Model 112 Motor Patrol, Condition Excellent.
Austin-Weston 99H New Nov. 1948. Int.-UD14 Diesel Engine.

EUCLID REAR DUMP TRUCKS:
Model 31FD New January 1946. Model 27FD New April 1946.
Model 27FD New April 1946. Model 27FD New November 1946.
NOTE: Must be sold as ONE UNIT

TOURNAPULLS:
4 LeTourneau Super C Tournapulls with LaPlant-Choate scrapers.
3 LeTourneau 10 yd. Rock Wagons.

WAGON DRILLS:
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Buckeye Model 120
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Butler complete ready-mix concrete plant 192 ton Agg. Bin 350 bbl. bulk cement bin.
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Butler 300 ton 3 comp. bin has 1 compt. for 400 bbls. cement, complete with weighbatcher, bucket elevator, etc.
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Derrick & Hoist 75 tons stiff leg.
American Terry stiff leg 50 tons 90' bm.
American Terry, stiff leg 10 tons, 75' bm.
Ketler 25 ton Gin, 100 ft. mast 90' bm.
Insley Guy 20 tons, 115' mast, 90' bm.
Wiley 30 ton Steel Stiff leg, 60' boom.
Steel Guy 25 tons 110' mast, 100' bm.
Steel Guy, 75 tons, 125' mast, 115' bm.
Steel Stiff-leg 25 ton, 3 drum Elec. hoist.

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1½ Yd., P. & H. Model 700B Dragline & Shovel
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New and rebuilt dump bodies.

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7½ KW to 125 KW. Alternating and direct current.

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Buda, Hercules, Hill diesels, rebuilt.
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Lorain 30A chain crowd, LBS#5142, 16' boom 13'4" stick ½-yd dipper.
Lorain 40 Hi-Lift, 25' boom 19'8" stick LBS #5877, new ¾-yd dipper LBS#7750.
P&H 203A, LBS#2527, 19'6" boom 13' stick ⅝-yd dipper.
Bucyrus-Erie 30B tunnel front 9' stick 1½-yd dipper LBS#3392.
Koehring 502 with necessary parts to convert from crane to shovel, 21' boom 16' stick 1¼-yd dipper.

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Lorain 41 backhoe, LBS#5429, with 18' boom, 7' stick, 35" cutting width Amsco bucket. Will fit any ¾-yd Lorain with serial number over 9,000.

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New Osgood ½-yd Model 200.

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27" outside width drop bottom type LBS #1033, good condition.
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Ransome 34E dual drum, new October, 1943, with 36'9" boom, 1000 gallon auxiliary water tank, Cummins engine, rebuilt.
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Jaeger type "L" double screed, 10½'-12½', rebuilt.
Heltzel 10'-12' finisher, rebuilt.
Blaw-Knox gas-electric 10½'-12½', rebuilt.
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Koehring 10'-16' finisher, rebuilt.

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Blaw-Knox type SA 10'-15' spreader, new 1943. New condition.

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830'—Truscon 7"x8" forms, with stakes.
1380'—Heltzel 7"x8" forms, with stakes.
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1939 Ford V-8 truck with Davey 105 ft. compressor mounted. A-1 Condition.
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TRACTOR: Caterpillar D4, wide gauge, with blade.

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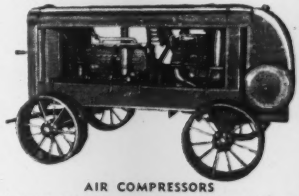

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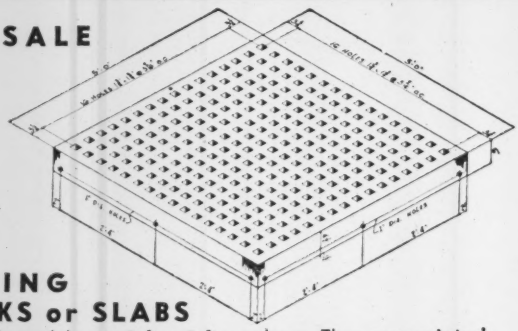

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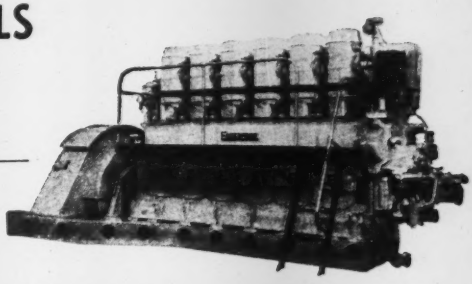

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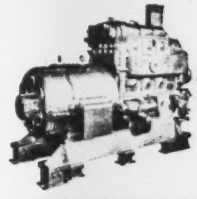

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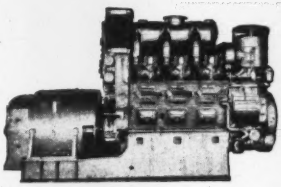

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42"	5	1/8"	1/16"
36"	6	1/8"	1/16"
30"	6	1/8"	1/16"
30"	5	1/8"	1/16"
26"	5	1/8"	1/32"
24"	5	1/8"	1/32"
24"	4	1/8"	1/32"
20"	5	1/8"	1/32"
20"	4	1/8"	1/32"
18"	4	1/8"	1/32"
16"	4	1/8"	1/32"
14"	4	1/16"	1/32"
12"	4	1/16"	1/32"

Inquire For Prices — Mention Size and Lengths

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HEAVY-DUTY FRICTION SURFACE

	Width	Ply	Width	Ply	Width	Ply
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	16"	6	10"	5	5"	5
	14"	6	8"	6	4"	5
	12"	6	8"	5	4"	4
	12"	5	6"	6	3"	4

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1½"	50 "	20.00
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	50 "	10.00	1.50 Pair
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1"	25 "	10.00	1.50 Pair
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	50 "	12.50
1¼"	25 "	7.50
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(Classified Advertising)

Abbott Salvage Co ... 187
Abramsen Co., Inc., John J ... 174
Acme Road Machinery Co ... 180
Acorn Iron & Supply Co ... 175, 176, 178, 180, 183, 184, 185, 186, 187
Admiralty Trading Co ... 187
Air Compressor Rental Co ... 181
Albert & Davidson Pipe Corp ... 182
Albert Pipe Supply Co ... 187
Allen, Charles P ... 182
American Air Compressor Corp ... 180
American Construction Co ... 182
American Enka Corp ... 173
Arko Products Company Inc ... 187
Babcock Equipment Co., Inc ... 180
Bauer, L. W ... 174
Bendix Machinery Co., Inc ... 178, 179, 180, 183
Bernstein Brothers ... 178
Bixby Inc., R. W ... 171
Bradford Supply Co ... 178
Buff ... 188
Bunce, Herman E ... 187
Callan Construction Corp ... 186
Candler & Bass, Inc ... 186
Cappello, A ... 187
Carlson Co., A. H ... 180
Carlyle Rubber Co., Inc ... 183
Carpenter, R. F ... 186
Cole's Trucking Service ... 186
Contractors Machinery Co ... 176
Crooks, B. S ... 182
Darien, Corp ... 186
Detroit Civil Service Comm ... 172, 173
Drachman Steel Corp., Hy ... 182
Drainage Contractors Inc ... 186
Dreifus Co., Charles ... 179
Dulien Steel Products, Inc ... 184
Dyer Co., The W. H ... 184
East Coast Valve & Fitting Co., Inc ... 174
Ehrhar Inc., Edward ... 176, 179, 183, 180
Ellis-Nowack Co ... 175
Equipment Corp. of America ... 179
Ferguson Construction Co ... 182
Finn Co., N. A ... 180
Foley Brothers Inc ... 184
Foster Co., L. B ... 186
Forsythe Equip. Co., Inc ... 185
Forte, John E ... 184
Frank, M. K ... 184
Frazier-Davis Construction Co ... 184
Gilgenbach Co., C. P ... 182
Golder Construction Co., Inc ... 186
Grandview Constr. Corp ... 184
Greensburg Machine Co ... 180
Greenpoint Iron & Pipe Co., Inc ... 187
Griner & Schmitz ... 188
Guion, H. P ... 183
Gurley, W. & L. E ... 168
Halloran, W. J ... 187
Hebenstreit, Julius ... 182
Hercules Elect. Machy. & Equip. Co ... 181
Hickerson, Ray D ... 188
Hodge & Hammond, Inc ... 176, 182, 185
Hoisting Machinery Co ... 183
Ingersoll Co., The Chas. M ... 175
International Const. & Equip. Corp ... 186
International Hoist & Machine Co ... 178
Jutton-Kelly Co ... 171
Kane & Associates, Valentine B ... 174
Kilmain Sales Co., Inc., T. J ... 182
Knox, R. M ... 182
Lewis, Harry C ... 175
Luff, R. M ... 186
Luxner Coal Co ... 187
McCormick & Sons Inc., B. B ... 186
Marsh Co., E. F ... 182, 184
Martindale, Frank L ... 173
Miller, Machinery Sales Luke ... 186
Mississippi Valley Equip. Co ... 176, 186
Morrison Railway Supply Corp ... 184
National Blue Print Co ... 188
Nedcar Excavating Co ... 180
Newburgh Downtown Realty Corp ... 175
Olympic Commissary Co ... 174
O'Neill, A. J ... 179
Pacific Bridge Co ... 184
Parkinson & Son, R. A ... 179
Petrus Industrial Machy. Sales ... 183
Pittsburgh Machy. & Equip. Co ... 180
Profenno Co., Camillo ... 186
Queensboro Steel Corp ... 179
Rail to Water Transfer Co ... 184
Rice, Inc., Harland G ... 184
Russell, T. Edgie ... 186
Schoonmaker Co., Inc., A. G ... 181
Shannon & Co., J. Jacob ... 181, 185
Sherman Transfer Co., The Roger ... 185
Smith Inc., L. B ... 175, 176, 177
Southwest General Construction Co ... 180
Stanhope Inc., R. C ... 176, 186
Tamblyn System ... 174
Thompson Co., Inc., J. Parker ... 178
Tractor & Equipment Co ... 176
Twentieth Century Builders Corp ... 172
United States Dept. of Interior ... 175
Van Houten Mchy. Co ... 185
Venice, Charles L ... 182
Villro Equipment Co ... 178
Vulcan Iron Works ... 185
Walsh, J. T ... 174, 178
Walsh Co., Richard P ... 176
Warren-Knight Co ... 188
Weil & Co., J. H ... 188
Weiss, B. M ... 185
Wepco Equipment Co ... 178
White Co., David ... 184
Wikstrom Inc., A. S ... 174
Wilson Engineering Corp ... 174

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OFFICIAL PROPOSALS

OFFICIAL PROPOSALS
(Continued from page 171)

Bids: May 11, 1949 (974)

Northeast Tunnel

CONTRACT SECTION 1
FOR THE
DEPARTMENT OF WATER SUPPLY
CITY OF DETROIT, MICHIGAN
CONTRACT NO. DWS-27

Sealed proposals for the construction of Contract Section One of the Northeast Tunnel will be received by the Board of Water Commissioners of the City of Detroit, at Room 506, Water Board Building, 735 Randolph Street, Detroit 26, Michigan, until 10:00 A.M. Eastern Standard Time, May 11, 1949, at which time and place they will be opened and read aloud. Proposals shall be addressed to the Board of Water Commissioners of the City of Detroit, and endorsed "Proposal for Contract No. DWS-27". Any proposal received after the time referred to above will be returned to the bidder unopened.

The work consists of the construction of approximately 5851 lineal feet of tunnel 10 feet in inside diameter, with tunnel lining of plain concrete or brick masonry. The tunnel connects to an existing branch at Pennsylvania and Forest Avenues, lies in Pennsylvania Avenue from that point to Gratiot Avenue, and continues north-east on Gratiot Avenue for approximately 700 feet.

The Contract Documents, including Notice to Bidders, Form of Proposal and Contract, Plans and Specifications, may be examined, and obtained during business hours, at the office of the Department of Water Supply, Room 706, Water Board Building, Detroit, Michigan.

Each proposal shall be accompanied by a certified check or a satisfactory bidder's bond in an amount not less than five per cent (5%) of the total lump sum price bid, drawn payable to the City of Detroit, Board of Water Commissioners, as security for the acceptance of the Contract.

No proposal may be withdrawn for at least 60 days after the scheduled closing time for receipt of bids.

The Board of Water Commissioners reserves the right to waive any informality in any bid and to accept or reject any or all bids, should it deem it to be for the best interests of the City of Detroit so to do.

CITY OF DETROIT
BOARD OF WATER COMMISSIONERS
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Edward C. Roney, Vice-President
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General Manager and Chief Engineer
E. H. Bauer,
Acting Secretary

Bids: June 15, 1949 (975)

Yonge Street Subway

TORONTO, CANADA

Sealed tenders, endorsed "Tenders for Yonge Street Subway, Contract S-2" will be received by the Toronto Transportation Commission at its office, 35 Yonge Street, Toronto, until 11:00 o'clock, A.M. Eastern Standard Time, on Wednesday, June 15th, 1949.

The work for which such tenders are invited consists of building approximately 3600 lineal feet of subway of various sections, together with miscellaneous work appurtenant and collateral thereto, as specified in the Contract Documents and shown on the plans. The work is to be constructed generally by what is known as "Cut and Cover Method". The work is located in Yonge Street between Queen Street and College Street in the City of Toronto, as described in more detail in Requirements for Tendering and Instructions to Tenderers.

All tenders must be made upon blank forms of tender as furnished by the Toronto Transportation Commission and included in the Contract Documents, and shall be made in accordance with the provisions contained in said documents.

The successful tenderer will be required to furnish, execute and deliver to the Commission a performance bond satisfactory to the Commission in the amount and within the time set out in the Contract Documents.

The Contract Documents, including plans and specifications, are on file and will be available to tenderers at the office of the Toronto Transportation Commission, 35 Yonge Street, Toronto, on and after April 14th, 1949. Copies of the Contract Documents may be obtained by depositing One Hundred Dollars ($100.00) with the Commission for each set of documents. The amount of the deposit will be refunded upon return of the plans and documents in good condition within ten (10) calendar days after the opening of tenders.

Each tender must be accompanied by cash or certified cheque on a chartered bank doing busines in the City of Toronto, in the amount of One Hundred and Twenty-five Thousand Dollars ($125,000.00) payable to the order of the Toronto Transportation Commission.

The Toronto Transportation Commission reserves the right to reject any or all tenders and to disregard any informalities in the tenders or tendering.

No tender may be withdrawn, after the scheduled closing time for receipt of tenders for at least forty-five (45) calendar days.

WILLIAM C. McBRIEN, Chairman,
TORONTO TRANSPORTATION
COMMISSION

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American Mutual Liability Ins. Co....38, 39
American Pipe & Construction Co..... 95
American Steel Dredge Co., Inc..... 168
American Surety Co..... 114
Armco Drainage & Metal Products, Inc. 147
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Bailey Meter Co..... 168
Baldwin Locomotive Wks..... 143
Barco Mfg. Co..... 123
Bay City Shovels..... 8
Belmont Iron Wks..... 144
Bethlehem Foundry & Machine Co..... 41
Bethlehem Steel Co.....124, 155
Blaw-Knox Div., Blaw-Knox Co..... 109
Bruning Co., Inc., Charles..... 22
Brunson Instrument Co., Inc..... 166
Buchanan Lumber Co..... 150
Bucyrus-Erie Co.....34, 35
Buff & Buff Mfg. Co..... 117
Byers Co., A. M.....2nd Cover
Byers Machine Co..... 21

Caterpillar Tractor Co.....16, 17
Celotex Corp., The..... 145
Cement Gun Co..... 158
Chain Belt Co..... 13
Chapman Valve Mfg. Co..... 33
Chicago Pneumatic Tool Co..... 115
Chrysler Corp., Industrial Engine Div.. 12
Clearprint Paper Co..... 2
Cleco Div., Reed Roller Bit Co..... 141
Clyde Iron Wks..... 165
Commercial Shearing & Stamping Co.. 158
Complete Machinery & Equip. Co..... 164
Concrete Surfacing Machinery Co., Inc. 136
Construction Machinery Co..... 167

Dearborn Chemical Co..... 140
Detroit Diesel Engine Div., General Motors Corp..... 86
Dixie Cup Co..... 159
Dodge Div. Chrysler Corp..... 127
Dravo Corp.....141, 149
Ductube Co..... 90

Economy Forms Co..... 167
Economy Pumps, Inc..... 125
Electric Steel Foundry..... 27
Electric Storage Battery Co..... 101
Electric Tamper Equipment Co..... 161
Eppinger & Russell Co..... 144
Erie Pump & Engine Wks..... 168
Erie Steel Construction Co..... 25
Euclid Road Machinery Co.....10, 11

Faber-Castell Pencil Co., Inc., A. W.... 122
Fairbanks, Morse & Co..... 118
Flexible Steel Lacing Co..... 113
Flink Co..... 130
Fort Pitt Bridge Wks..... 18
Four Wheel Drive Auto Co..... 104

General Electric Co..... 14
General Excavator Co..... 144
G. M. C. Truck & Coach Div., General Motors Corp..... 137
Goodyear Tire & Rubber Co..... 1

Gordon Smith Co..... 163
Gorman-Rupp Co., The..... 126
Governair Corp..... 105
Griffin Wellpoint Corp..... 136
Grinnell Co., Inc..... 119
Gunite Concrete & Construction Co..... 168
Gunite Construction Corp..... 105

Harnischfeger Corp..... 91
Heil Co., The.....102, 103
Hendrick Mfg. Co..... 161
Hendrix Mfg. Co., Inc..... 36
Hewitt-Robins, Inc..... 26
Hudson-Rumsey Co., Inc..... 164

Industrial Brownhoist Corp..... 130
Ingersoll-Rand..... 7
Inland Steel Co..... 42
International Harvester Co., Inc..... 146
Irvington Form & Tank Corp..... 141

Jaeger Machine Co.....82, 83
Joy Mfg. Co..... 28

Kinnear Mfg. Co..... 163
Koppers Co..... 87

Layne & Bowler, Inc..... 114
Lehigh Portland Cement Co..... 152
LeTourneau, Inc., R. G.....110, 111
Lincoln Electric Co..... 131
Lith-I-Bar Co..... 118
Lock Joint Pipe Co..... 92
Louisville Cement Co..... 6
Luria Engineering Co..... 121

MacArthur Concrete Pile Corp..... 114
Mack Trucks, Inc..... 9
Macomber, Inc..... 135
Macwhyte Co..... 20
Manhattan Rubber Div..... 154
Marion Metal Products Co..... 150
Marion Power Shovel Co..... 84
Master Builders Co.....3rd Cover
Master Vibrator Co..... 139
McCaffrey-Ruddock Tagline Corp..... 163
McGraw-Hill Book Co..... 122
McKiernan-Terry Corp..... 128
Mixermobile Mfrs..... 5
Moretrench Corp..... 133
Mott Core Drilling Co..... 130

National Clay Pipe Mfrs., Inc..... 151
National Gunite Corp..... 118
Naylor Pipe Co..... 160
Nelson Stud Welding Div. of Morton Gregory Corp..... 19
New York Engineering Co..... 142
Northwest Engineering Co..... 3

Ohio Locomotive Crane Co..... 125
Osgood Co..... 144
Owen Bucket Co..... 192

Pennsylvania Drilling Co..... 117
Pittsburgh-Des Moines Steel Co..... 37
Pittsburgh Steel Prdts. Co..... 29
Plymouth Locomotive Wks. Div., Fate-Root-Heath Co..... 139
Portland Cement Assn..... 40
Pressure Concrete Co..... 150

Raybestos-Manhattan, Inc., Manhattan Rubber Div..... 154
Raymond Concrete Pile Co..... 81
Rockford Clutch Div., Borg-Warner Corp. 117
Rogers Bros. Corp..... 93
Royal McShea..... 152
Ryerson & Son, Inc., Joseph T..... 166

Sauerman Bros., Inc..... 113
Schramm, Inc..... 23
Shotcrete Construction Co..... 168
Simplex Valve & Meter Co..... 108
Smith Engineering Wks.....106, 107
Sparling, R. W..... 156
Spencer, White & Prentis, Inc..... 162
Sprague & Henwood, Inc..... 105
Stang Corp., John W..... 90

Texas Company.....4th Cover
Thew Shovel Co..... 15
Timber Structures, Inc..... 88
Timken Roller Bearing Co..... 93
Tinney Drilling Co..... 125
Torrington Co..... 134
Truscon Steel Co..... 46
Turner Halsey Co..... 31
Twin Disc Clutch Co..... 148

Underpinning & Foundation Co., Inc..... 162
Unit Crane & Shovel Corp..... 100
U. S. Pipe & Foundry Co..... 24
U. S. Rubber Co.....32, 116
U. S. Steel Corp. Subsidiaries.....48, 157
U. S. Steel Supply Corp..... 157
Universal Atlas Cement Co..... 48
Universal Sewer Pipe Corp..... 89
Upson Walton Co..... 4

Vacuum Concrete, Inc..... 156
Viber Co..... 94
Vulcan Iron Wks..... 136

Wallace & Tiernan Co., Inc..... 120
Welsbach Corp., The..... 44
Williams Co., J. H..... 168
Wood Co., R. D..... 138

Yaun Dragline Bucket Co..... 168

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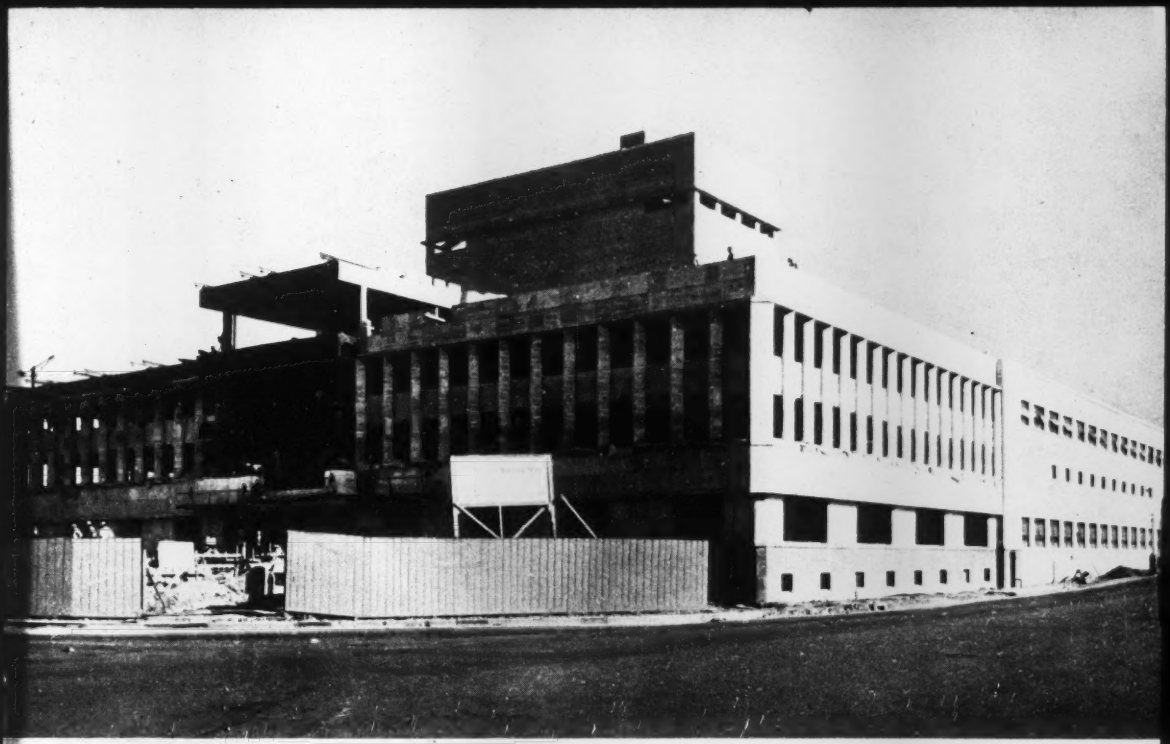

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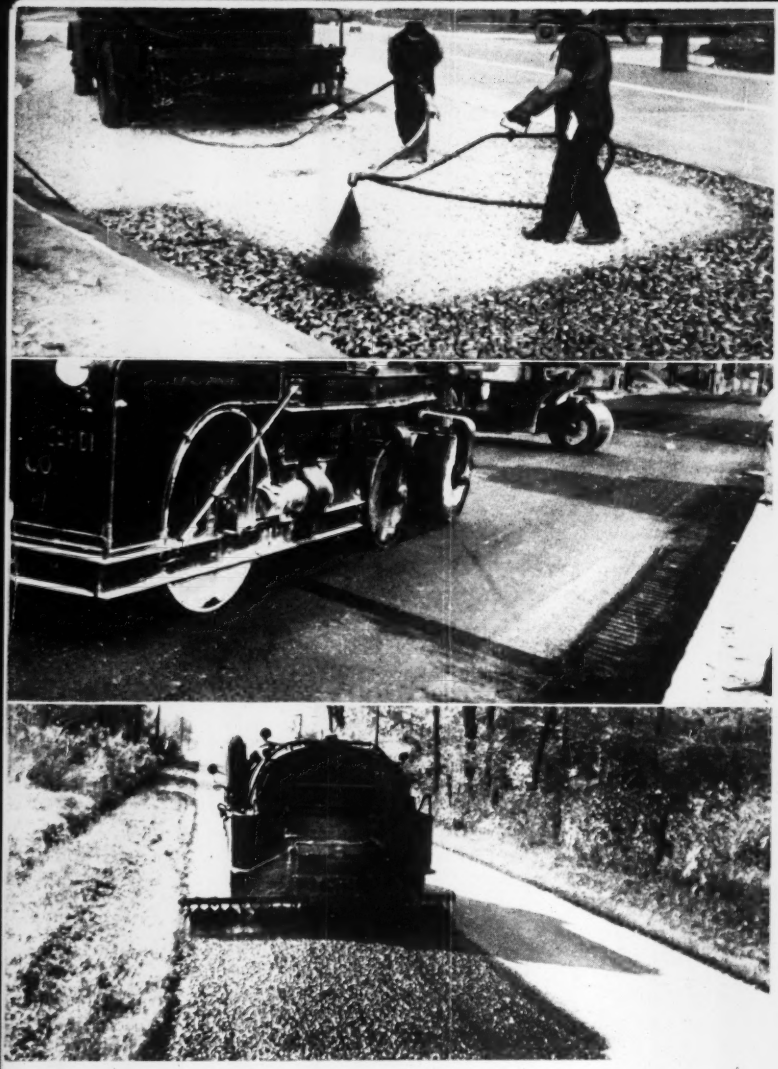

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